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TO OUR READERS.

We this week conclude the long series of illustrations on the cañons of the Colorado, which has made the geology and topography of that most interesting region familiar to our readers.

The great beauty of the scenery so admirably represented in the exquisite engravings we have published attracted much attention, and, joined to the remarkable clearness with which the geological and topographical features are explained in Major POWELL's report, has drawn from the readers of the JOURNAL many expressions of warm approval.

We shall conclude with our next number Prof. SMYTH's course of lectures on mining, which has been run through the entire year. We shall replace these articles by others of great value, and shall devote more and more attention to illustrations of mining, geological features, metallurgical works, and other subjects of practical value as well as of general interest.

We shall shortly commence the publication of a large number of illustrations of the principal ore dressing works and their machinery in Europe.

We shall also publish plans and full bills of materials for miners houses of the most economical and approved types; drawings of the machinery, and bills of material and cost for an anthracite coal breaker of approved type.

We shall publish working drawings of furnaces, ore dressing machinery, mine machinery, etc., and, in short, endeavor to give in attractive readable form to each class of our readers—by no means neglecting the working miners—such information as may be of practical value.

The ENGINEERING AND MINING JOURNAL will, we trust, become indispensable to every intelligent miner, mining engineer, metallurgist, civil engineer, and capitalist interested in mining metallurgy.

THE EXECUTIVE MESSAGE.

The country is to be congratulated upon the moderation, firmness, and clearness of the President's Message and the reports of the heads of departments. In a time when both parties are largely infected with heresy and delusion in matters of finance; when great masses of the people are sincerely, though mistakenly, in favor of perilous, not to say surely disastrous, measures; when politicians are specially tempted to take advantage of such popular errors in order to retain the power which existing parties are too evenly divided to control; it is pleasant to find the administration unanimous, decided, and unflinching in the support of that sound policy which everybody favored a few years ago, and to which everybody will return when this nightmare of cheap money has passed.

We need not repeat the argument of President HAYES. It is substantially that which has been urged in our columns. The President is in favor of the use of both gold and silver as currency; and because he desires this, he desires the only means by which it can be effected, namely, the subordination of one metal by limiting its legal tender character. Whether a silver dollar will be a convenient and popular coin, we doubt. In our judgment, the half-dollar is large and heavy enough; and bank notes for sums larger than a dollar will be preferred. But the main thing is that neither gold nor silver coins shall be driven out of the country.

The Secretary of the Treasury supports with cogent arguments the position of the President, showing clearly the paramount importance of the refunding of the national debt, and the fatal effect which the proposed silver legislation will have upon that process. The money thus lost to the government will be lost from the pockets of the people in the most direct way. It is many millions of dollars actually paid out annually, which could be saved but for the tampering of the silver party and the inflation party with the pledges of the government, and hence with the public credit. It is clear that honesty is the best policy by exactly two per cent. on every six—a handsome showing for virtue, in these hard times.

In the face of these clear, strong, dignified statements from the administration, it is doubtful whether Congress will invite a veto by passing an Unlimited Silver Bill. *

A METRIC WIRE GAUGE.

Our excellent contemporary, the *American Manufacturer*, of Pittsburg, makes the following pertinent suggestion, in reviewing the recent report read before the Institute of Mining Engineers:

"We would here make a suggestion which we commend especially to the advocates of the metric system of weights and measures. Let all sizes of wire and of sheet metal be expressed in millimeters and fractions of a millimeter, and not either in numbers as at present, or in thousandths of an inch. It would be an important advantage gained in the introduction of the metric system, and there would be involved no more trouble in changing from the present system of numbered gauges to metric measures, than there would be in changing from the present system to measurements expressed in thousandths of an inch. The present system *must* be done away with; had we not better change it at once to the metric system rather than to a system based on the inch as the unit, which may itself be changed before many years? We hope the question will be thoroughly discussed. The more the absurdity of the present system is shown, the sooner we will arrive at a more correct one."

We quite agree with the *Manufacturer* that our present system of measures is perfectly absurd, and a disgrace to our civilization. The adoption of the metric system is *inevitable*; why then retard it by introducing another gauge, that will have to be changed when the metric system comes in general use, and why defer the general adoption of the system any longer?

IS THE GOLD SUPPLY FAILING?

Staff Correspondence of the Engineering and Mining Journal.

The recent work of Prof. Swess, of Austria, on the future gold supply of the world, has attracted much attention in American mining circles, on account of the conclusion reached. After collating a vast amount of statistical material, and examining the present condition of the great gold fields of the world, as well as those portions of the earth's surface which are as yet comparatively unexplored, but whose geological character, being known, may be reasonably calculated upon, he is induced to believe that, in the future, the gold production of the world will steadily diminish, and bases this opinion mainly on two reasons:

1st. The continued decrease in the yield during the past quarter of a century.

2d. Geological reasons, which are:

(*a*) All the great gold fields of the world are already discovered.

(*b*) The great placer deposits, which, since the Californian and Australian discoveries, have yielded about 90 per cent. of all the gold thrown into market, are rapidly approaching exhaustion.

(*c*) The gold quartz veins never can be relied upon, either to equal the past yield or maintain that of the present.

It will not be attempted to discuss this entire subject thoroughly, for we have not at hand the material for such a work, nor do we believe that enough data on which to found a conclusive argument, either for or against this view exists. The production of gold on the globe, which now is avaraging about $100,000,000 annually, has varied greatly at different times during the last two centuries, and is known to have fluctuated more or less within the limits of recorded history. In fact, one has only to read the pages of Jacobs's *Treatise on the Precious Metals*, which is, perhaps, the most exhaustive work of its kind ever published, to become convinced that what records do exist in ancient and medieval books on this subject are so vague, contradictory, and inconclusive, that an argument based upon them must prove unsatisfactory even to the close student, while the uninformed reader will find himself utterly confused in the maze of conjecture and hypothesis. It is, of course, known with certainty that at times the production has increased and diminished greatly, but satisfactory statistics of the yield are attainable only for the work of the past century at best. Upon the figures of a hundred years, nothing, of course, can be concluded, and very much less from those of the past thirty years, during which not only have the two greatest gold discoveries of the world been effected but the progress of civilization and the arts has made enormous strides. We think, therefore, that Prof. Swess's first reason will hardly satisfy even surface thinkers.

Of his succeeding ones, which are all geological, the first and third may be passed over lightly. It is hardly credible that Africa, from which so much of the precious metal has come in the past, will not, in its turn, supply a great and new gold district to the commerce of the world, to say nothing of the vast and unknown lands in northern and central Asia, and the still unexplored reaches of the Sierras and Andes in the western continent. As to the future of our quartz mines, that is still a matter of conjecture, not as to their permanence, but as to their producing quality. Rock mining is an industry of slow growth, because it is one requiring capital; and all over the world the working of veins for gold is still in its infancy.

A much more attractive and interesting field for study is, however, opened by Prof. Swess's statement regarding the placer deposits of the world. It is one in which comparatively little outside of bare statistics of production is

known. The origin of alluvial gold deposits has scarcely been looked into by the mining world, and we are convinced that some very erroneous views are held on the subject even by students. Perhaps, the enormous production from this source has made a statistical study of the question more interesting than a geological one, or the ease with which the deposits are worked, and the absence until very recently of science, skill, and knowledge in the industry, may have given the impression that there was little to be found of scientific interest in it. Whichever has been the case, the misconception is an important one. It may be safely concluded that 90 per cent. of all the gold bullion produced since the dawn of history (which by the best authorities has amounted to over $7,000,000,000 worth) has been taken from alluvial deposits. If the sources of this enormous amount are approaching exhaustion, there are certainly grounds for apprehension that the annual production of the world will steadily diminish in the future. No satisfactory conclusion can be reached on this point until the origin and formation of alluvial gold deposits is thoroughly understood.

The general idea is that the gold, being originally projected through the earth's crust in veins, has been during the ages washed out of these, as the great mountain chains have been eroded, disintegrated, and cut into by natural agents. Experience proves this supposition to be true in at least a number of cases. Thus there can hardly be a doubt that the rich gulches of California, Montana, Colorado, and Idaho were filled in this way. But experience has also shown that these same ravines are quickly exhausted of the best of their golden store, and, as soon as this occurs, attention is drawn to other gravel deposits of a poorer quality, but of much greater extent, the position of which, both geological and topographical, forbids the supposition that their wealth was derived directly from the erosion of veins. To this class belong some of the ancient channel beds of California, notably what is known as the Blue Lead, and similar, though, perhaps, not so extensive formations in the three other States mentioned. It is but recently that serious work has been done on these deposits, but enough of them is known to assure us that their extent is something enormous, far beyond that of the shallow and recently cut gulches and bars from which so many millions in dust have come. Whence, then, was the origin of these? Allowing the geologist to have full play in reconstructing from their shattered remains the mountain chains which crossed the American continent in the past, limiting his reconstruction within the time during which these ancient channels were filled, it will still be found impossible to account for the extensive auriferous deposits on the supposition of the erosion of gold veins alone. The distribution of the metal is too regular and its physical condition too uniform to admit of this hypothesis. A secondary or intermediate origin must be sought for, and, as soon as the attention is drawn to this, a new element will be found in the subject of placer deposits, which, we believe, will throw an entirely new light upon the subject.

The geologist who travels across the western half of the American continent will find on both sides of the Rocky Mountains, at very many places, and extending over vast areas, outcrops of what is now believed by the best judges to be the Potsdam sandstone. It occurs generally next to the granite or gneiss nucleus of the central mountains. It is highly metamorphosed into a quartzite of quite uniform texture, and is of a bright clean texture and a light gray color. Once fairly seen and studied, it may immediately be recognized among the numerous other quartzites which occur within the same limits, and with moderate care it may be traced with but few and short interruptions from the Rio Grande to the British line. Its visible outcrop traverses New Mexico and Colorado a short distance west of their center, passes through the southwestern corner of Wyoming and the southeastern corner of Idaho, is discernible in heavy masses on both sides of the Rocky and Bitter Root ranges in Montana and Northern Idaho, is found again, going southward, along the eastern flanks of the Sierras and Coast Range in California and Oregon, in many places overriding the summits, and passes off into British America, over districts four and five hundred miles in width. Vast areas have suffered total demolition and disintegration during the past, and only traces here and there are left.

Examination of this formation reveals the startling fact that it is almost everywhere auriferous to a slight degree. At several decided centers of upheaval, such as Mount Lincoln, Colorado; Bald Mountain, near Bannack, in Montana; in Western Oregon, and Northern California, it is rich in gash veins carrying the purest kind of gold ore; but these are probably accidents of comparative recency. Elsewhere gold is found disseminated with great uniformity throughout its entire mass.

There will be no particular advantage at present in searching for the cause of this extensive impregnation of gold, though an explanation is not difficult. The rock and its precious contents—what is left of it—is there, and at one time doubtless covered an area of 600,000 square miles. Of course, it may safely be concluded that those portions eroded were of the same character as that which is left; and, these facts once recognized, there will be found no difficulty in accounting for the very extensive low grade gravel deposits which exist at so many places throughout the West. The Columbia, which perhaps at one time emptied its waters into the Pacific far to the south of its present mouth, and possibly followed the course of the ancient auriferous channel, which has been traced for 500 miles, north and south, through Oregon and California; the Upper Missouri, several of whose dry beds have been found in Western Montana; the Platte (North and South Fork), the Arkansas, the Rio Grande, the Gila, and the Upper Colorado, with its numerous tributaries; all of these have, for centuries, been cutting into and washing away this ancient sandrock, and depositing its golden contents in deep and shallow banks throughout the broad areas beyond the Plains.

As stated before, explorations have but just begun on these secondary gravel deposits. In California the greatest headway has been made, while in other parts of the West only a few localities have been touched. Of course, many thousand miles of these banks and bars are of too poor grade to be touched yet, if at all; but hundreds of miles of old channels of great richness exist, and will ultimately be opened. To all intents and purposes, these alluvial deposits are exhaustless. If we sum up the area of those known to exist already, placing their value at 15 cents per cubic yard—a low estimate, and yet one at which heavy profits may be made with the improved hydraulic machinery of the day—their average depth at only 10 feet, and the saving effected at only 50 per cent., the quantity of gold to be extracted from them alone reaches the enormous sum of 100,000 millions, a figure so large as to be nearly incredible.

To produce this is, of course, the work of centuries, and we may come down from the contemplation of such an enormous figure to the modest yield of the present day with as much rapidity as will be convenient to the average mind. We think Professor Swess's hypothesis of the rapid exhaustion of the world's placer mines will not be found to be true. The surface mines in America have perhaps seen their best day, but these hold but a thousandth of the store still available. And when it is remembered that we have been considering nothing but the American mines, there is still less to be apprehended.

THE EXCHEQUER AND OPHIR OPERATIONS.

Staff Correspondence of the Engineering and Mining Journal.

The general condition of the mining stock market in San Francisco has been very thoroughly illustrated in the recent operations in Exchequer and Ophir. For the last six months it has been pitiful to witness the efforts being made by the ring brokers to create another excitement in Comstocks, and to draw back some of the capital which has been gradually edging away from that famous institution and devoting itself to outside mines, where rings and pools were less frequent, and where investors could lay out their money in a business-like manner. There can be no doubt that confidence is utterly lost in Washoe; not so much in the mines as in the management of them. There is a point beyond which human credulity cannot reach, and that point appears to have been reached. The thousands of outsiders who supported the street and the market two years ago by their small contributions will no longer take a hand in a game that is so openly one-sided, though the bonanza mines still yield their glittering dividends, and the bonanza papers still defend the gamble and the gamblers.

Exchequer is one of the low and cheap stocks. It is a north-end mine, and has been on the anxious seat for many years. Its *forte* has been more in the line of assessments than anything else, and consequently it is an easy stock to handle; a small amount of cash will cover many shares. On the principle that it is a long lane that has no turn, each additional assessment is presumed to bring it so much closer to the great bonanza which is believed by the devout Californian to lie somewhere in the bowels of every claim on the Comstock. These being the circumstances, a small and select band of New York brokers, possessed of more brains than money, and burning with the laudable desire to show their Pacific coast brethren a few new kinks in the business, started overland to make a corner in Exchequer. On arriving at San Francisco the first thing to be done, of course, was to capture the principal holder of Exchequer stock, which was accomplished by offering him a neat slice of the pool earnings. Secondly, mysterious reports were circulated in the papers of a great New York syndicate formed to operate in Comstocks, and the public having, by this means, been excited to the proper point, the pool operators sat down deliberately to draw them in. The operation, owing to its ingenuity and intricacy, was a long one, and required nearly two months for its completion. Its minute details need not be described here, and in fact all these are not yet known, but in all essential points they were similar to the systems of ordinary stock gambling, intensified by a few transactions somewhat more outrageous than had hitherto been attempted. When finally the climax had been reached, the New York brokers stepped from under the balloon with their profits and departed, leaving the victims to crawl out of the ruin as best they could.

The fracture of the pool caused for a few days the greatest possible excitement on the street. As a rule, Californian operators have shown little disposition to wince when they were down, but the methods employed to corner Exchequer proved to be so atrocious that the matter was pushed into the courts and efforts were made to recover. This is a rare circumstance among professional brokers, and, perhaps, in this case, the fact that the winners were Eastern men contributed to the anger felt. The entire affair, however, indicates an unusually low condition in Washoes, and points plainly to the fact that in the near future, if not already, nothing can be made in Comstocks unless the operators are possessed either of gigantic capital or gigantic intellect. The Exchequer pool bargains are now being dragged slowly through court, and will shortly be forgotten by all but the victims.

The Ophir movement is still in operation, and is more likely to extend at present than to diminish. A strike was made some time ago on the 1,900-foot level drift. Immediately the drift is boarded up, the miners placed under lock, and everything done to prevent the public, who have been supporting the stock and paying assessments on it for years, from learning the facts. Meanwhile the ring operators are immediately informed, and, under the belief that a great strike has been made, buy in the stock quietly at bottom prices. The informa-

tion, however, leaks out, Ophir goes up with a bound, and in a few days is worth double its former value. The public clamor for admission to the mine, and are refused, but the superintendent proceeds with the drift, under guard, and, after penetrating twelve or fifteen feet of ore, strikes porphyry, which effectually puts an end to the expected bonanza. This change is communicated to the ring, who immediately throw their stock on the market while the price is still high, and realize a hundred per cent. profit. When they have unloaded, the drift is generously thrown open to experts and newspaper men, excellent porphyry is found at the breast, and the price tumbles to the old standard.

This is about the present condition of the property. As soon as the fact became known that porphyry had been encountered beyond the twelve-foot vein of ore, the stock which had fallen assumed, under the numerous and contradictory statements concerning this porphyry, a very feverish condition. Those who believed the new formation to be a horse bulled the market, and those who had no confidence in this view took the opposite course. Meanwhile the diamond drill was brought into service, and pushed into the barren ground under the greatest secrecy. For a week this course was pursued, and, after a distance of sixty feet had been reached without results, the fact is made known. The latest reports we now have from the mine indicate that the management si not hopeful of reaching ore again.

We publish a statement to the effect that the drill will be set to work at another point further south, but this information will hardly hold the stock at bonanza figures much longer, nor will it clear the management from the reports now being so freely circulated—that, in the whole operation, a dishonest and unfair advantage has been taken by the insiders to bleed the pockets of the street, to their own profit.

While the JOURNAL does not express or feel any very hearty sympathy for the losers in Exchequer or Ophir—for a majority of the recent speculators in the stock have had abundant opportunities to learn the dangers of the game in which they have taken a hand—yet the frequent occurrence of these disastrous excitements in mining stocks points so clearly to the decadence of legitimate stock speculation, and the rapid increase of pure gambling, as to merit serious attention. The difficulty is one that can only be successfully handled by the honorable brokers of the street, and ought to engage their consideration.

CORRESPONDENCE.

THE TELEPHONE IN THE MINES.

TO THE EDITOR—SIR: In the last number of your JOURNAL a correspondent writes, under the head "The Telephone for Mines," something that, I think, conveys an erroneous impression.

Your correspondent writes—"Besides, without a battery and electric bell, how is attention to be called?"

In almost all instances where the Bell telephone is used a magneto-electric call-bell is also used. This, of course, requires no battery.

This bell would, I think, be easily heard at the pit bottom, or at any point in a mine where work was going on, and the work could be suspended for a moment while the message was being received.

In justice to the Bell telephone, you will oblige me by inserting in the JOURNAL the gist of what I have written. Truly, yours,

PROVIDENCE, Nov. 22, 1877. G. L. BRADLEY.

We recently had the opportunity to see the telephone at work between the works and office of the Buffalo Cement Company, in Buffalo, a distance of six or seven miles. At the works a steam pipe was leaking, and the noise was distinctly heard in the office, though it did not interfere with the messages. At the works, however, it was almost impossible to hear, except when the operator shouted. The point made by our correspondent, referred to in Mr. Bradley's letter, was well taken, though, probably, the difficulty is overestimated.

ED. E. & M. J.

"THE LOWE GAS AND PROF. MORTON."

By Henry Morton, Ph. D.,

President of the Stevens Institute of Technology, Vice President of the American Chemical Society, etc., etc.

I find in the ENGINEERING AND MINING JOURNAL of December 1 an article with the above title, in which my name figures not only in the heading but throughout the text, and which, though quite unworthy of any attention from a scientific point of view, contains so many false suggestions and insinuations, chiefly of a personal character, that, lest silence should seem to give assent, I feel called upon to notice it.

In the first place, its author, Mr. Geo. S. Dwight, is kind enough to settle my profession for me, and to charge me with going out of my department of physics in order to make a gas analysis. Had Mr. Dwight given himself the trouble to inquire, he might have found that I formerly occupied the chair of chemistry in the University of Pennsylvania, and also in the Philadelphia Dental College; that I have published many researches involving as much chemical as physical work, and that for several years I have been engaged as chemical expert in some of the most important patent suits in New York and Boston involving questions of chemistry. In fact, I began the study of chemistry when I was a boy, and have pursued it ever since. That Mr. Dwight has only heard of such of my work as was specially in the line of physics is, of course, a great misfortune, but does not deprive me of my twenty-five years' chemical experience.

As to the anonymous "authorities eminent in practical chemistry," with whom he threatens my speedy demolition, I have only to say that the sooner he produces them the better I shall be pleased.

My processes and results are no new thing with me, but have borne the test of long use in my hands, as well as in those of others, and I have not the slightest doubt that every one of my results will be fully supported by every *honest* analysis which is made.

In regard to the garbled extracts and false inferences which constitute the mass of Mr. Dwight's article, I have only to say that, if those competent to judge such matters will read the full text of my report, I will be fully vindicated, and my critic answered, in their eyes, without another word from me.

As to the wonderful future results which are to convince me that a water gas can be successfully and economically manufactured by the Lowe process, I would say that no one will be more easily convinced than I *when the facts are present*. I have no interest either way in the question. My business as a *chemist* is to make accurate analyses of such materials as I am requested to examine, and to answer such questions as are put to me by those applying to me for information. If, in so doing, the facts thus made public should hit hard any one interested in their suppression, I must, of course, take my chance of such recalcitrant attacks as this article of Mr. Dwight's represents.

Feeling, however, the most complete confidence in the accuracy of my methods and results, I am as little disturbed by his mysterious threats of opposing facts *to be developed* in the future, as I am by the unsupported assertions and innuendoes which seem to constitute his whole material of war at present.

Regarding Mr. Dwight's allusion to Mr. Geyer's method of collecting the gas, it only shows that he is even more ignorant of that gentleman than of me, or he would hardly have ventured the suggestion. I have only to say that I will accept with pleasure the entire responsibility which he offers to throw upon me.

APPROXIMATE COSTS OF CONVEYING THE MINERAL REQUIRED FOR MAKING ONE TON OF PIG-IRON IN GREAT BRITAIN AND THE UNITED STATES.

By I. Lowthian Bell.

GREAT BRITAIN.

	Of Fuel.			Of Ore.			Of Limestone.			Total Cost of Carriage.
	cwt.	s.	d.	cwt.	s.	d.	cwt.	s.	d.	s. d.
West of Scotland	44½	1	9	43½	3	9	14	1	2	6 8
" "	65	1	11	38½	4	1	14	1	8	7 8
South Staffordshire	40	1	6	55	2	9	10	0	6	5 0
Cumberland	24	9	7	36	4	6	8	0	7	14 8
Lancashire	24	10	0	36	4	6	8	0	7	15 1
Lincolnshire	25	9	9	70	2	9	0	0	0	12 6
South Wales	40	1	9	45	13	6	15	0	9	16 0
Middlesborough	26	3	0	65	4	0	12	1	6	8 6

The united make of the above being equal to five-sixths of that of the entire Kingdom.

Applying the data I obtained in the United States, I have estimated the raw materials cost of conveyance calculated on the raw materials per ton of pig iron to be to furnaces as follows:

UNITED STATES.

	Cwt.	Miles.	Money.	Cwt.	Miles.	Money.	Cwt.	Miles.	Money.	Total Cost for Carriage.
			£ s. d.			£ s. d.			s. d.	£ s. d.
Lehigh Valley	35	40 to 50	0 8 2	40	30 to 40	0 12 0	20	....	1 0	1 1 2
Philipsburg	35	40	0 8 9	40	....	0 9 4	20	....	1 0	0 19 1
Lake Champlain	30	330	1 1 0	32	7	0 4 0	50	....	0 6	1 5 6
Cleveland	30	90	0 11 9	30	600	1 2 6	15	...	1 9	1 16 0
	10	180								
Harrisburg	36	60	0 10 2	40	25 to 150	0 10 0	15	....	0 9	1 0 11
Lebanon, Pa	35	87	0 11 9	40	7	0 3 0	15	....	0 3	0 15 0
Hanging Rock	40	6	0 6 0	60	5	0 9 0	20	...	1 6	0 16 6
Pittsburg	25	10 to 60	0 3 9	30	....	1 10 0	15	20	1 6	1 15 3
West Virginia	25	....	0 11 0	40	2	0 4 0	10	....	1 0	0 16 0
Cincinnati	26⅔	....	0 16 0	30	....	0 10 9	10	....	1 0	1 16 9
St. Louis	32	85	0 18 6	28	....	0 12 6	6	....	1 0	1 12 0
Chicago	27	...	1 3 0	36	....	1 2 0	17	....	1 6	2 6 6
Alabama	40	2 to 5	0 3 0	40	10 to 20	0 5 0	15	....	1 6	0 9 6
Indiana	30	....	0 2 0	35	....	1 15 0	12	....	1 0	1 18 0

These figures are subject to a good deal of variation, according to the ores or fuel in use at the time.

If it is desired to see how any particular locality stands in the item of charges for carriage, the following approximate statement may be taken as a guide in the estimate. In it the Atlantic transport from Glasgow to New York is taken at 15s., which is 5s. below the average of former years, and to which 2s. 6d. is added for dues from the furnaces to the vessel:

	Carriage on minerals.	Carriage to New York.	Total.
	£ s. d.	£ s. d.	£ s. d.
Scotland	0 7 2	0 17 6	1 4 8
Cumberland	0 14 8	1 0 0	1 14 8
Lancashire	0 15 1	1 1 11	1 17 0
Middlesborough	0 8 6	1 3 0	1 11 6
Lehigh Valley	1 1 2	0 7 6	1 8 8

A HEAVY ORDER FOR ENGINEERS' INSTRUMENTS.

One of the largest orders which has been given in this country for surveying instruments was recently given by Columbia College, of this city, to the well known manufacturers, Messrs. Heller & Brightly, of Philadelphia. The first installment of this order, consisting of eight combined transit and leveling instruments, four Y levels, and four plane-tables, has just been delivered. The requirements of the School of Mines, under the "new departure" inaugurated by Professors Trowbridge and Munroe, it is expected, will call for over three dozen transits, levels, and plane tables. This high indorsement to the excellence of Messrs. Heller & Brightly's instruments must be valued, by these gentlemen, far beyond the mere money involved in this order, and it confirms the good opinion of these instruments which has long been held by engineers who have used them.

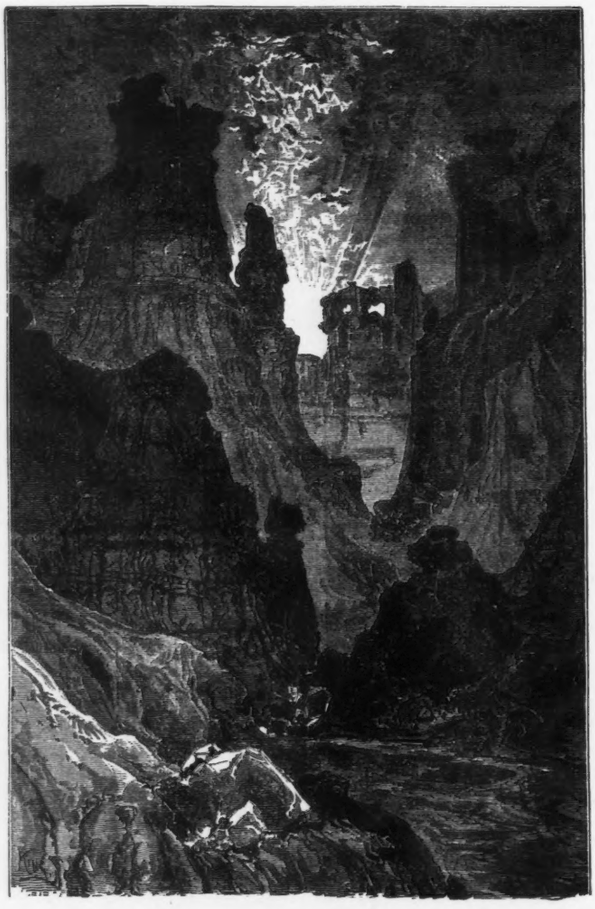
INFLUENCE OF PRESSURE ON COMBUSTION.—M. V. Wartna has been making experiments on the influence of pressure upon the phenomena of combustion. He has burnt stearine candles in the air at an ordinary pressure, and at a pressure of 1·95 atmospheres in a large iron chest, determining in each case the quantity of matter burnt per hour. Those burning at the common pressure had a flame of 4·5 to 6 centimeters in height, and consumed hourly from 9·34 to 10·70 grams of stearic acid. At the increased pressure the flame was very sooty, of a yellowish-red, and from 9 to 12 centimeters in height, but the quantity of stearic acid consumed was only 7·99 to 9·11 grams. He burnt also candles at very low pressures, as, *e.g.*, 9 centimeters of mercury. The flame was much increased, lost its brightness, and took a greenish-blue color. Three portions could be plainly distinguished—the central part of a greenish-blue, quite detached from the wick, and having the form of a cap. This part is enveloped in a violet mantle, and this again in a second violet mantle, so pale as to be scarcely visible.

LECTURES ON MINING.—No. LIX.

By Prof. W. W. Smyth, M. A., F. R. S., Royal School of Mines, London.

CONCENTRATION OF ORE.

We come next to a part of our subject which, at first appearance, is not of a very interesting character, but, when looked into, it is found to contain a great deal which is interesting, although beset with multitudinous details and with great variety of apparatus, either brought into use, in different districts, or patented and never brought into use. It will be my object to-day to put before you a sort of division and grouping which will enable you to see what are the principal features of the apparatus next following on the comminution of the ore; leaving to the next lecture the consideration of the methods of dealing with the gravels and coarser sands, such as are produced by the crusher, and which, as a rule, require to be treated in a different manner. We may, therefore, pass to the consideration of the methods of enriching or concentrating the divisions of the ore, which are of the nature of fine sand, down to excessively fine slime, produced by the stamps, and having passed through sieves of suitable dimensions. It has long been a desideratum to divide the stuff, as it comes from the stamps, more accurately, because if you have a material composed of particles of very varied sizes, it is a matter of great difficulty to separate the parts by virtue of specific gravity. A reference to Agricola's book will show that, hundreds of years ago, great care had been bestowed on arrangements for exposing the ore to a flow of water which shall deposit the material in positions according to its specific gravity, and thus giving the heaviest and most valuable material a chance to be deposited at the upper end of the bed. This may be paralleled by the simple arrangement in Cornwall for dressing the stream tin, where the material is thrown on a plane surface, slightly inclined, and a stream of water then allowed to flow over it. The larger portions are picked out and examined by the eye, the useless being thrown away, the promising ones being put aside, perhaps for the stamps. Meanwhile, the smaller sized material will be carried on by the water, and at the end of this plane will be directed by a hanging board into a box, or "tye," below, where it will run down a gentle slope, and holes in the lower end of this box, as it tends to fill with sediment, will be plugged up. When you come to examine the deposit, the most valuable mineral will be found in the upper part of the tye, while that at the other end, or tail, will perhaps not be worth any further treatment. On this principle, more or less, will be founded the whole series of apparatus which we have to examine to-day. The material coming out of the cofer of the stamps runs first down a sloping bed which will not retain anything on it, and then on to the less inclined beds, where the mineral is to be deposited. It becomes an important question as to whether you cannot save something by mechanical means on the first bed, and this it is possible to do in some cases, where fragments or strings of native metal, gold, etc., occur. This may be done by placing bulls' hides with the hair pointing up the bed, as in the Brazilian mines, these being taken up and washed separately every few hours, and a good proportion of best gold is thus obtained. In other cases coarse flannel, canvas, etc., specially made, or (as the Wallachians do) turfs have been used for the same purpose. Where there is nothing to catch in this manner, as in the case of the tin stamps, it is usual to run the material out into a series of tyes placed at a very small angle, which varies according to the nature of the material. Sometimes, when a specially rich part of a vein is cut, the heavier mineral may be deposited so soon as to choke up the passage, so that a special box, called a "saver," is placed horizontally at the outlet to save the material. This apparatus does not give you such a division, according to size, as is desirable, so that an apparatus has been devised by Rittinger which seems to have done very good service in the Hungarian mines. The water carrying the stamp material is made to flow through a series of four boxes; these have sloping sides such that no material will rest on them. The matter then deposited in the first, for example, falls to the bottom, and there passes through an opening into a siphon, the flow through which is regulated by a stop-cock; similarly with the other boxes. To extract the material it is only necessary to open the stop-cocks and allow a small stream of water to flow through the siphon, which will carry out the deposit, and may take it at once to the inclined planes, thus avoiding any necessity for interrupting the main flow for the purpose of removing the sediment. Under various modifications this machine has been employed in the Harz, Saxony, and Hungary, and the general testimony is that the division of the sediment according to size in this way gives greater facility in the subsequent processes. In our own tin mines in Cornwall, something of the same kind has been in use, where the water runs into conical sheet-iron vessels, and is made to circulate so as to form a kind of whirlpool; and in this way you may have the whole of the rougher part deposited, and only the slime flow away. This, then, can be allowed to accumulate, or, what is better, be led off at once to the dressing troughs.



THE CANONS OF THE COLORADO RIVER.

FIG. 40.—MU-KOON'-TU-WEAP CANON.

The apparatus employed for dressing is to be looked upon mainly as an inclined plane, generally of wood, though of late years glass has been employed, in some cases sheet or cast iron, and in Austrian mines slabs of marble. A mixed stream of pulverized mineral and water being sent over such an inclined plane, the forces acting upon the mineral will be—first, the impetus of the water, which will depend upon the quantity of water and the area of the surface over which it flows; secondly, gravitation, which will cause each particle to exercise a pressure on the plane; thirdly, there will be the resistance due to friction, which will vary according to the nature of the material used; and lastly, there will be the cohesion of the particles amongst themselves, which will be much greater in the case of ores associated with argillaceous matters than when quartz is the accompanying material. We may divide these machines into two classes—those which have a fixed inclined plane, and those which have a movable one. The former class, which will be treated of in this lecture, may be again subdivided into "buddles," or those which are intended to receive a thick deposit; and "frames," or tables, which receive only a thin deposit. The nature of the plane itself will have far more influence in this latter class than in the former. As an example of the simplest form of buddles, we may take a common form much used in the North of England and in our western districts, not so much employed now as it was a quarter of a century ago, but which may readily be put up, and, what is important, in which there is very little fear of loss of mineral. It consists of a pit 8 to 12 feet long, usually lined with timber, while above the pit, inclined at a considerable angle, is a head-board down which the water and ore run to the pit. Sometimes a series of pegs are arranged on this head-board, which can be turned about so as to regulate and evenly distribute the flow over the board. And in these cases, too, there may be at the top of the channel a head-button, which can be arranged to direct the stream either to the right or left side of the head-board, so that one side may be in use while the other is being cleaned. A less satisfactory arrangement may be often seen, especially in some of the small lead mines in the North, where there is what is called a "nicking board." A quantity of ore, in the shape of a thick mud or clay, is placed on the head-board, and an attendant allows the water from above to flow over the board by nicking the mass of ore with a shovel or hoe in parts so as to regulate the flow, and allow it constantly to carry away some of this material in suspension. The water is made to flow in a series of waves, and not in a direct manner, out of the buddle, lest it tend to make a series of channels instead of spreading in a thin broad film. By stopping up holes at the end of the buddle with pegs, as in the tye previously described, it will be arranged always to have a tail of water at the bottom end. Care must be taken, as deposit after deposit is formed thickest at the upper end, that the slope does not become too great, and so a quantity of the stuff pass down to be lost; the deposit must not, therefore, be kept till too high. When it has reached 12 to 18 inches, the flow is stopped and the sediment is taken up, generally in three parts, that nearest the top being the richest—"heads," the "middles," and lastly "tails." It depends on the character of the material as to whether this last is worth further treatment. An attendant on a transverse bar across the pit, with a besom or hoe, keeps working up against the current of water on the head-board, so as to clear away slime and prevent irregularities. Where the head-board with a series of pegs is used, the pulverized ore is mixed up with the water, either by a shovel or machinery, and then, after passing through a grating to stop chips or large stones which may have got in, it is fed through a hopper on to the head-board; the rest of the arrangement is like that with the nicking board. About thirty years ago, it was suggested that a great deal of manual labor was expended on this apparatus, and that little work was got through in a given time. Hence, as the object in the western districts was to get through as much material as possible, and thus be enabled to dress varieties of ore which otherwise they could not work, the method of treatment by a circular buddle came into play. In the ordinary buddle there is a circular bed, 12 feet by 18 feet diameter, sloping gently towards the circumference, and surrounded by a wall. In the center is a circular area of some 6 feet diameter, with sides sloping more steeply than the bed of the buddle. On to this table the mixed ore and water is delivered from a sheet-iron hopper in which it is carried, and this is made to revolve on a vertical axis. The axis also carries a series of cross bars to which are suspended rods of wood, or a series of light brooms of heather, or such material, or brushes, or it may be flaps of canvas, according to the quality of the mineral. These spread the ore evenly over the floor, but they must be raised from time to time, as the deposit goes on, in order that they may not interfere with the material deposited, and thus lead to waste, but only lightly scrape the surface, so as to prevent the formation of channels. The mixed material, poured on to the upper inclined plane which we may regard as the head-board, will run down on to the floor of the buddle, and there deposit the sediment in the form of heads, middles, and tails. In what are known as slime buddles, a horizontal shaft carries a series of knife blades which cut up the material; then, on a second axis, a set of vanes which beat the water and mix up the material with it; and on a third axis, a series of brushes which, as they revolve, sweep over a series of small-holed grates, through which the mixed material passes to the inclined planes, and thus clear the grates of stones, etc. An additional set of vanes may be added, if necessary, to strike the water and cause it to flow in a series of waves. A much rougher kind of buddle is used by the slime dressers, where,

instead of having a raised central table, the mixed water and slime is allowed to fall from a trough directly on to the center of a prepared circular space. As a general rule, the buddles will be 12 to 18 feet diameter, and very few exceptional cases pass beyond that; but perhaps the largest buddles in the world are those in the parish of St. Just, in Cornwall, which are not less than 50 feet diameter. The best diameter of the central portion is still a matter of uncertainty; some have it only 2 feet diameter, other dressers think it should be half the diameter of the buddle. As this part is not intended to catch any material, it will depend very much on the thickness of the material mixed with the water, how far it is desirable to spread it before the sediment begins to be deposited; as a general rule, it will be 4 to 6 feet diameter. The much greater quantity of work which can be got through with these circular buddles than with the old rectangular ones is one reason for the adoption of the former, and the decreased number of the latter form now in use. Of variations, we have the concave buddle, introduced by Hundt, of which many examples are to be found at work in our mines, as well as in continental districts. In this the inclined plane is placed in the opposite direction—that is to say, it slopes towards the center, and the material is given out by a series of spouts round the circumference, and an arrangement is placed in the center to prevent water going out with too much of a rush. A series of brushes are constantly going round and sweeping the surface, as in the other form. According to some dressers, from the facility with which a concentrated current towards the center is obtained, washing away the deads very efficiently, this form is better than the other, and if there is much rubbish mixed with the mineral, it may do very well; but there is a greater risk, and perhaps, also, some practical objection, seeing there are not so many of this form now, in comparison with the ordinary form of buddle, as there used to be.

The other class of machines, and perhaps the most striking, are those which have been in use for a long time in Germany, and especially Saxony, for the treatment of their argentiferous ores. These are "tables," very carefully constructed, placed at a very low angle of inclination, with a grating to strain off chips and stones, and a head-board with an arrangement for equalizing the flow of water. In the use of these frames, or tables, it is necessary to have a supply of clean water to dilute down to a requisite point the material which has been mixed, delivered by means of a tap into the hopper, or box, from which the material passes to the head-board. In some of the Hungarian mines these frames are used 18 feet to 24 feet long, so that in these great lengths the whole of the valuable material is taken out. As usual in these processes, an attendant with a wooden hoe rakes up against the flow of water during the deposition, and at length there comes a time when it is desirable to introduce the clear water. Accordingly, the dirty water is stopped and the clear water turned on, and then, with a light brush or hoe used very lightly, the attendant just sweeps against the flow, and thus a good deal of the mere slimy deposit is got rid of. Then the lower end of the deposit is removed, and afterwards the upper, sometimes by means of a trap-door in the center of the frame, but more usually one portion after another is led down into little boxes placed at the end. The frame used in our western districts has dwindled away of late, but is still largely employed. The table itself is not nearly so long as in the foreign arrangement; the material flows over a flap on to this table. The latter is supported at top and bottom on pivots, in order that it may be turned sideways on these pivots for the purposes of clearing. When the bottom boards are covered with deposit, the dirty water is stopped and the clean water let on, and when as much slime as possible is cleared off, the table is turned sideways on the pivots, and a stream of water then used to wash down the deposit into boxes placed at the side. In consequence of the necessity of dressing at a very economical rate, a large number of modifications of this system have been employed of late. For example, the Red River, which flows by Redruth, in Cornwall, has been shown to carry away much valuable mineral as refuse from the mines, and self-acting frames have been arranged so as to allow the material to flow over them for a certain time, and then (by the filling of a trough with water, or other such method) the frame overbalances, and at the same time opens a tap, which lets on a stream of clear water to wash off the deposit into proper receptacles. All the machines we have been considering in this lecture are for the treatment of the finer products of comminution, extending from the size of a coarse grain of sand down to the finest slime.—*London Mining Journal.*

THE CANONS OF THE COLORADO RIVER.

FIG. 41.—PILLING'S CASCADE, THE LOWER FALL ON PINE CREEK.

PREMIUMS OF THE LONDON INSTITUTION OF CIVIL ENGINEERS.

The Council of the Institution of Civil Engineers invite communications, of a complete and comprehensive character, on any of the subjects included in the following list, as well as on other analogous questions. For approved original communications, the Council will be prepared to award premiums, arising out of special funds bequeathed for the purpose. The competition is open in nearly all cases to those not members of the Institution.

LIST OF SUBJECTS FOR PAPERS.

(1) Triangulation survey, and mapping of countries and districts, including the astronomical observations required for latitude and longitude, and the measurement of bases; with a description of the instruments employed, the reduction of the observations, and degree of accuracy of the results. (2) Leveling of countries, either by spirit-leveling, vertical angles, barometers, or the boiling point of water; with a description of the instruments employed, the reduction of the observations, and degree of accuracy of the results. (3) Manufacture of cements, comparing the processes followed in different countries. (4) Manufacture of bricks by machinery, including descriptions of special kilns, etc. (5) Effect of the lapse of time on the strength of materials strained bevond the supposed limit of elasticity, but within the ultimate strength. (6) Causes of slips in rocks and earths of different kinds, and the conditions that induce treacherous ground in railway cuttings, tunnels, and the sides of valleys near reservoir banks. (7) Application of steam machinery for excavating, and the cost as compared with hand labor. (8) Results of the use of steel in mechanism and in works of construction. (9) Construction of warehouses and of other buildings to resist fire, and the relative merits of stone, brick, iron, and timber for that object. (10) Warming and ventilation of large buildings. (11) Different systems of road-making best adapted for large towns, or where the traffic is heavy, including a comparison of first cost, maintenance, and durability. (12) Design and construction of masonry dams of great height for retaining water in reservoirs. (13) Storage and filtration of water, both natural and artificial. (14) Benefits and expedients of irrigation in India and in other warm climates, and the proper construction of irrigating canals, so as to avoid erosion or silting, and to prevent the growth of weeds. (15) Constant service of water supply, with special reference to its introduction into the metropolis, in substitution for the intermittent system. (16) Systems of domestic water supply suitable for rainless districts. (17) Different systems of opening bridges, with details of the modes of working them. (18) Design, generally, of iron bridges of very large span, for railway traffic. (19) Design and construction of dock gates and caissons, including the requisite external and internal arrangements, illustrated by recent practical examples. (20) Design and construction of building slips for large vessels. (21) Appliances and methods used in different countries for tunnel driving, rock-boring and blasting, with details of the cost and of the results attained. (22) Works carried out for the improvement of the Seine and other French rivers, and of inland navigation generally. (23) Relative value of upland and of tidal waters in maintaining rivers, estuaries and harbors. (24) Construction of tide gauges, and the usual method of carrying out a systematic series of tidal observations. (25) Differences in design of British and foreign locomotive engines; showing the benefits derived from the increase in weight, and the relation that ought to exist between the diameter of the wheel and the load it has to carry. (26) Lighting of railway carriages. (27) Construction of steam boilers adapted for very high pressures. (28) Best practical use of steam in steam engines, and the effects of the various modes of producing condensation, and of various grades of expansion. (29) Modern construction of marine engines, having reference to economy, by superheating, surface condensation, high pressure, great expansion, etc. (30) Modern experience in screw propulsion, comprising the comparative efficiency of propellers of large diameter, and of smaller ones deeply immersed, and the influence of form. (31) Best shapes for yachts and for ships for commercial purposes. (32) Relative efficiency of the screw propeller and paddle wheels for towing purposes. (33) A comparison of the different modes of transmitting power for auxiliary purposes on board ships, and in shipyards, and engine factories. (34) Various descriptions of pumps employed for raising water or sewage, and their relative efficiency. (35) Relative advantages of wind and water as motive powers, compared with steam power, and the motors most suitable for utilizing them. (36) Compressed air as a motive power, particularly as applied to machinery in mines and to locomotives in tunnels, with some account of its application on the Continent. (37) Manufacture of mineral oils, and the lamps best adapted for their consumption in dwellings and lighthouses. (38) "Output" of coal in the United Kingdom, as compared with that of other countries, illustrated by statistics, showing where coal is produced, where and how it is consumed, and the relative quantities exported. (39) Methods and machinery employed in sinking and in working deep coal mines. (40) Coal depots for ocean steamers, the various points involved in their management, and the methods of preserving large quantities of coal from deterioration. (41) Metalliferous or other mining districts in different countries, and the mode adopted in working them. (42) Methods employed in securing the excavations in mining large and irregular-shaped mineral deposits, for example, the Almaden Mines, the Great Comstock lode, etc. (43) Appliances used in different countries for dressing the ores of lead, copper, zinc, and tin, and the smelting of such ores, with details of the results and costs by various methods. (44) Losses in the reduction of metallic ores by different methods, distinguishing losses in dressing from those in smelting. (45) Disposal and utilization of slags from various smelting processes. (46) Management of underground waters in mining districts, and the relative economy of distributed or trunk pumping engines, adits, etc., in particular cases. (47) Appliances and processes for the manufacture of artificial fuel in different countries. (48) On recent progress in telegraphy, with a notice of the theoretical and practical data on which that progress has been based. (49) Electricity as applied to lighting purposes. (50) On torpedoes, and their influence on naval construction.

Communications must be forwarded to the house of the Institution, 25 Great George Street, Westminster, where any further information may be obtained.

IN WORKING THE BORAX MINES IN THE STATE OF CALIFORNIA the boracic minerals are lixiviated at one boil in large wooden cisterns holding about 14,000 liters. When the liquid rises to 28° B., the clear portion is run off into crystallising tanks three metres long, two high, and one in width, where the solution cools slowly down to 25°, which may take from six to ten days. When it gets below 28° the process is watched, so as to get rid of the mother liquors before sulphate of soda is deposited. When the mother liquor is run off there is also an escape of mud mixed with octahedral crystals of borax, which are washed in the mother liquor of the next operation, and preserved to be refined. At the bottom of the tanks is a deposit of borax, sometimes 15 centimeters thick, which is broken up with pick-axes and washed.

GRAPHIC METHOD OF KEEPING THE RECORD OF WORKING OF A BLAST FURNACE.*

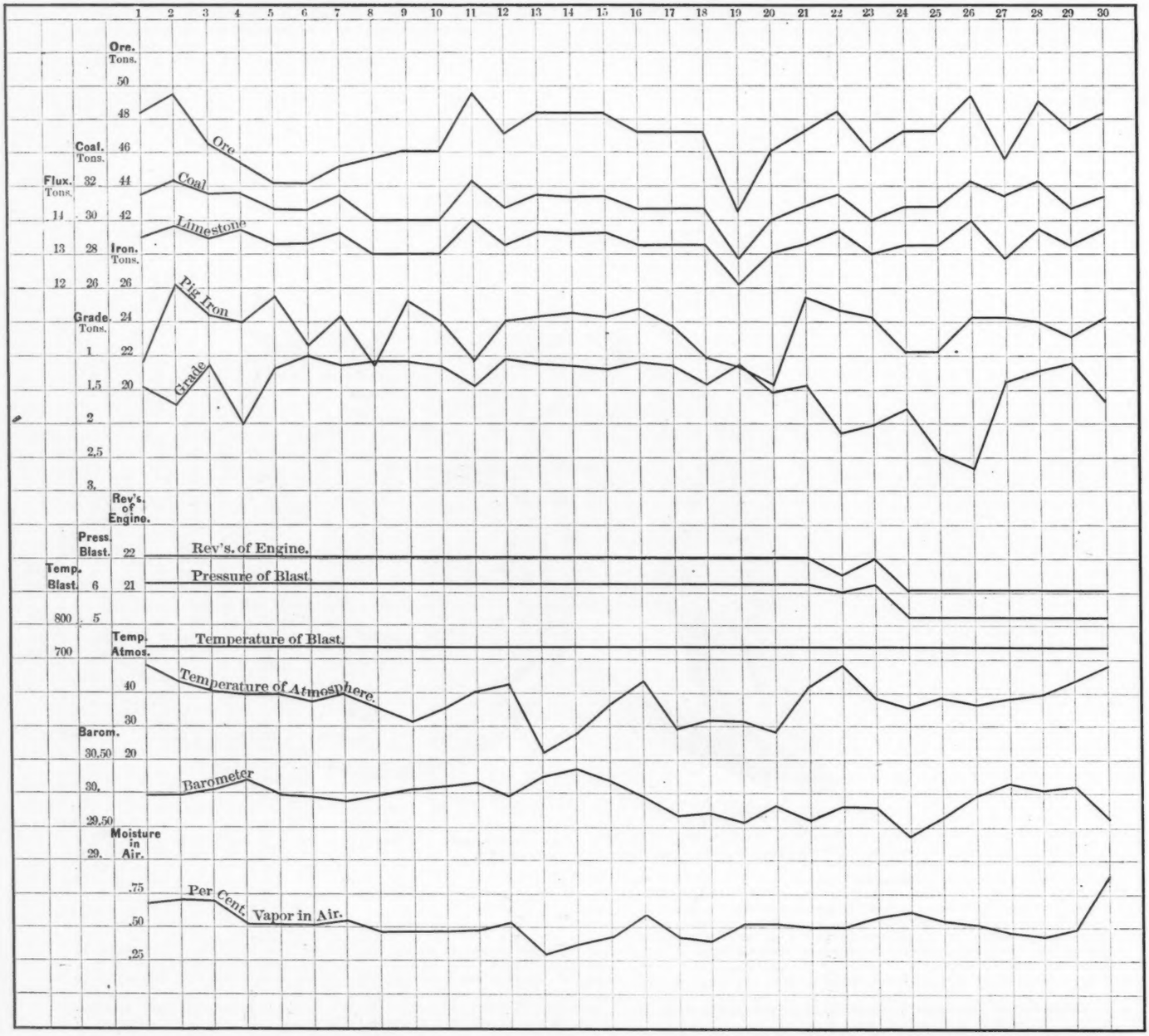
By William Kent, M. E., of Pittsburg, Pa.

In a paper by Mr. Frank Firmstone, published in vol. iv. of the *Transactions* of the Institute, on "Comparison of Results from Open-topped and Closed-top Furnaces," the regularity of the average grade of pig iron produced, by the furnace under different conditions is expressed by means of a curve or diagram.

The object of this note is to show that the graphic method, or that of representing variations by plotted curves or diagrams, is capable of a much more extended application to blast furnace records, making a valuable auxiliary to the "furnace book," and that by it the practical metallurgist may obtain at a glance information concerning the variations of the furnace during long periods, which could be found in the furnace book only after a tedious search.

To keep a record of this kind for a whole year, it is only necessary to procure a sheet of common profile or cross section paper, about 38 inches long and 8 or 10 inches wide, with cross lines ruled about 0·1 of an inch apart. The vertical lines, or those in the direction of the breadth, are marked with the days of the year; the horizontal lines serve as divisions of arbitrary scales of the variable quantities which enter into the furnace record, the scales being written in figures at each end of the sheet.

Every day, after entering in the furnace book the usual record of charges, fuel, ore, flux, revolutions of engine, temperature and pressure of blast, quantity and grade of product, etc., the clerk enters these same variable quantities upon the diagram sheet, by making a dot or mark for each variable on the vertical line representing the day; the position of the dots on the line being determined by reference to the scales at the end of the sheet. The dots entered from day to day representing each variable are joined by straight lines, making thus a continuous irregular line or diagram. The magnitude and position of the arbitrary scales at the ends of the sheet are determined to suit convenience, so that the irregular lines representing each variable will not crowd or interfere with each other. The time necessary for keeping such a graphic record, if the furnace book record is properly kept, should not be more than one or two minutes each day.



The accompanying plate is a graphic record of an anthracite blast furnace for one month. The table on the next page gives the figures obtained from the furnace book, together with a record of temperature of the atmosphere, barometric pressure, and moisture in the air, which was obtained from a meteorological observatory not far from the furnace.

In the records of a furnace, two of the variable quantities are final results, viz. the quantity of pig iron produced, and its grade; all the other variables are antecedent causes which produce the final results. Of these variable causes which contribute to the quantity of product and its grade, some are partially under the control of the furnace manager, others depend upon the state of the atmosphere, and still others are accidental. Of the first class are the character of the materials charged, and their relative proportions, their mechanical conditions, as wet or dry, large or small pieces, etc., the revolutions of the engine, the heat and pressure of blast, and the distribution of the charge. Of the second class are the number of pounds of air blown into the furnace for each stroke of the engine, the amount of moisture in the air, and the condition of the chimney draughts. These vary largely with the season of the year. Of the third class is the leaking of a tuyere or a temporary stoppage.

Regularity in quantity and grade being a chief requirement in working a blast furnace, it is desirable to know what *quantitative* effect changes in each of the antecedent conditions of the first two classes above mentioned have upon this result, so that the furnace manager may know how to control the working of the furnace, by first knowing the effect of a change in those conditions over which he has no control—as changes in the atmosphere—and, secondly, how and to what

* A paper read before the American Institute of Mining Engineers, at the Amenia meeting, October, 1877.

RECORD OF A BLAST FURNACE FOR ONE MONTH.

Day.	Charges. Coal. Tons.	Coal. Cwt.	Ore Tons.	Ore Cwt.	Limestone. Tons.	Limestone. Cwt.	Revolutions of Engine per minute.	Blast. Pressure.	Blast. Heat.	Product. Tons.	Product. Cwt.	Product. Average grade.	Atmosphere. Temperature.	Atmosphere. Barometer.	Atmosphere. Moisture, per cent.	Burden. Ore and Limestone.
1	31	10	48	6	13	10	22	6¼	740	21	15	1·49	48·0	29·06	0·68	2200·644
2	32	5	49	9	13	16	"	"	"	26	5	1·72	41·7	29·95	•·71	2200·644
3	31	10	46	11	13	10	"	"	"	24	10	1·11	40·0	30·04	0·68	2159·652
4	31	10	45	9	13	14	"	"	"	24		2·00	39·6	30·22	0·52	.....
5	30	15	44	2	13	7	"	"	"	25	10	1·17	39·7	29·97	0·52	.....
6	30	15	44	2	13	7	"	"	"	22	15	1.00	37·3	29·92	0·51	.....
7	31	10	45	3	13	14	"	"	"	24	5	1·12	39 7	29·84	0·57	2300·652
8	30		45	11	13		"	"	"	21	10	1·09	35·0	29·97	0·46	.....
9	30		46		13		"	"	"	25	5	1·08	31·3	30·03	0·46	.....
10	30		46		13		"	"	"	24		1·12	35·0	30·07	0·46	.....
11	32	5	49	9	14		"	"	"	21	15	1·41	40·0	30·11	0·47	.....
12	30	15	47	3	13	7	"	"	"	24		1·04	41·7	29·94	0·53	.....
13	31	10	48	6	13	14	"	"	"	24	5	1·10	22·0	30·25	0·32	.....
14	31	10	48	6	13	14	"	"	"	24	10	1·12	27·7	30·37	0·38	.....
15	31	10	48	6	13	14	"	"	"	24	5	1·18	36·6	30·20	0·43	.....
16	30	15	47	3	13	7	"	"	"	24	15	1·08	42·7	29·92	0·61	.....
17	30	15	47	3	13	7	"	"	"	23	15	1·15	19·6	29·70	0·43	.....
18	30	15	47	3	13	7	"	"	"	22		1·40	31·0	29·73	0·40	.....
19	27	15	42	11	12	1	"	"	"	21	10	1·13	35·0	29·57	0·52	.....
20	30		46		13		"	"	"	20	5	1·51	28·7	29·79	0·52	.....
21	30	15	47	3	13	7	"	"	"	25	10	1·42	42·0	29·67	0·50	.....
22	31	10	48	6	13	14	"	"	"	24	15	2·16	48·0	29·77	0·50	.....
23	30		46		13		21½	6	"	24	5	2·00	38·3	29·77	0·61	.....
24	30	15	47	3	13	7	22	6¼	"	21	5	1·75	35·3	29·37	0·62	.....
25	30	15	47	3	13	7	21	5¾	"	23	5	2·47	38·0	29·63	0·55	.....
26	32	5	49	9	14		"	"	"	24	5	2·65	36·7	29·95	0·51	.....
27	31	10	45	11	12	18	"	"	"	24	5	1·37	38·7	30·03	0·45	2100.609
28	32	5	49	1	13	15	"	"	"	24		1·22	39·6	30·01	0·43	2300·644
29	30	15	47	3	13	7	"	"	"	23	5	1·11	44·0	30·07	0·49	.....
30	31	10	48	6	13	14	"	"	"	24	5	1·70	48 0	29·64	0·88	.....

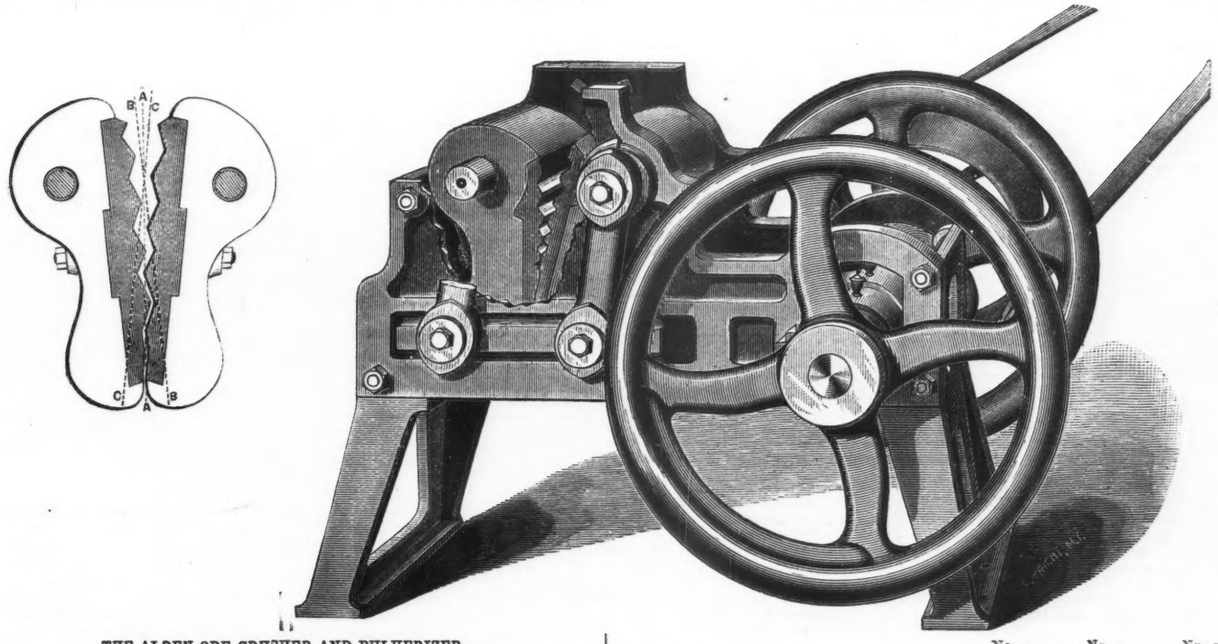
extent he can counteract these effects by making changes in those conditions over which he has control.

If all the ordinarily variable antecedent conditions in the working of a blast furnace should become constant, the quantity and grade of product would be constant. If all conditions remained constant, except the atmosphere, the quantity and grade would change with the atmosphere, and the furnace manager, who, by experience had become acquainted with the effect of changes in the atmospheric conditions, might, on observing an atmospheric change, *predict* or *prevent* the change in the working of the furnace, without waiting for it to be made known to him by a change in the appearance of the cinder, or of the iron in the pig bed.

The graphic method of recording the variable conditions and results which attend the working of a blast furnace, offers to the furnace manager a valuable auxiliary to aid him in his observation and study of the effects of changes in the variable antecedent conditions above mentioned upon the variable results. By it also he can study the effect of arbitrary experimental changes in method of working a furnace, or the results of two furnaces differing in any of their features. The diagrams in the accompanying plate are so irregular that they seem to follow no law, and it could scarcely be expected that any important deductions could be made from the record of only a single month; but there is one peculiarity of the diagram, representing average grade, which may be worthy of attention.

From the 19th to the 26th of the month there is a rapid fall of the average grade from 1·13 to 2·65. The cause of this fall appears to be indicated by the atmospheric record. The temperature rises, from the 19th to the 22d, from 28·7 to 48 degrees; the percentage of vapor in the atmosphere rises, from the 18th to the 24th, from 0·40 to 0·62 per cent., and the barometer ranges lower during the same period than at any other portion of the month. The revolutions of the engine remaining constant, these atmospheric changes would cause a chilling effect upon the furnace, and a fall in grade of the iron.

It is not my intention, however, to discuss here any theory of furnace working, but merely to point out the value of the graphic method in studies of this kind, which should insure its adoption at every furnace.



THE ALDEN ORE CRUSHER AND PULVERIZER.

This new crusher is intended to perform the work of the ordinary rock crusher and rolls. It consists of two oscillating jaws or dies, suspended from shafts the ends of which project through the sides of the frame and take connecting rods which at their other extremities receive studs that jut out from the sides of a rectangular yoke. This yoke, one side of which only is shown in the above figure, surrounds the free hanging ends of the dies and moves on a nearly horizontal plane, alternately pushing and pulling the dies within it the full distance of the stroke, and imparting the *rubbing effect*, which is the basis of the merit of this machine. The regulation of *the set* of the dies to different grades of production is effected by means of adjustable steel keys. A variety of these are furnished with each machine. Every crusher, whatever its size, has a range of from the very finest product required, to a degree of coarseness closely approaching the size of the feed. The connection between the yoke and crank is direct by means of a pitman.

In operation this machine grinds the ore to almost any desired degree of fineness at one operation; the lower extremities of the jaws are the same distance apart through the whole oscillation, while the remainder of the jaws, being corrugated, are constantly changing their distance apart, and the ore is, therefore, being constantly rubbed and crushed throughout every portion of the oscillation. It is claimed that this machine "will crush ore to any given size, in less time, with less power, and with no more cost in wear and tear than can be done by other crushers of like receiving capacity." It is also claimed for it as an advantage not possessed by other crushers, it will "size" its product from any grade of coarseness up to No. 40 mesh wire screen. As giving some idea of the work which this ingenious crusher and pulverizer is capable of doing, a letter from the superintendent of Messrs. Park, Bro. & Co., of the well known Black Diamond Steel Works at Pittsburg, states that in a trial at that works 2,246 lb. of Lake Champlain ore were reduced at one operation—in 19 minutes—to a "fix" of size of fine gravel, sand, and dust. The following are some particulars regarding the weight, size, and price of these machines:

	No. 3.	No. 4.	No. 7.
Dimensions of receiver	14" x 7"	14" x 5"	10" x 3"
Floor space occupied	10' x 5'	10' x 5'	6' x 4'
Height over all	6'	6'	4'
Dimensions of driving pulley	42" x 12"	40" x 10"	30" x 6"
Revolutions per minute	140	150	200
Horse power required, maximum	20	20	10
Gross weight of machine	18,000 lbs.	17,900 lbs.	4,500 lbs.
Heaviest piece	2,425 "	2,425 "	450 "
Price, f. o. b. N. Y.	$1,500	$1,400	$700

The accompanying general view and the sectional cut show the arrangement of the parts so clearly as to make a more detailed description unnecessary. By no means the least important feature of the Alden crusher for our always more or less inaccessible mining regions, is the small weight of the heaviest parts as compared with those of other crushers. Those desiring further information can obtain it by addressing Messrs. Copeland, Dodge & Co., whose business card will be found in our advertising columns.

MEMORANDUM RELATING TO THE "BOILER ACCOUNT," AS KEPT DURING THE CONSTRUCTION OF THE EDGAR THOMSON STEEL WORKS, PITTSBURG, PA.*

By P. Barnes, Plainfield, N. J.

The subdivisions of this account are numbered 27, 28, 29, 30, 31, 32, and 33, in the general series of construction accounts, and give the details of cost of the various items of the work, as noted below.

Accounts 32 and 33 relate to hand-tools and to heaters, and, being quite small in total amount, these are omitted in this statement.

The accounts were all as minutely subdivided as possible, and they show simply the sums of money paid for the materials or for the labor involved, the

* Read before the American Institute of Mining Engineers, at the Amenia meeting, October, 1877.

items being taken by permission from the original vouchers filed in the office of the company.

All items less than $5, and all sums paid for freight, are omitted in making up the abstract, so that, while it does not show with absolute minuteness the details of cost, yet it may serve a useful technical or professional purpose as a basis for comparison with similar details of work executed elsewhere.

It may be needful to say, by way of brief explanation, that the boiler-house referred to is 46 feet wide by 180 feet long, and affords room for 20 boilers, of which 16 were erected, and are included in the statement of cost.

Each boiler is 5 feet diameter and 15 feet long, and had 40 4½-inch tubes. Six tubes have since been removed from each boiler.

The boilers are set in plain brick walls, the usual grate being placed beneath one end, and the gases return through the tubes and escape through a 75-foot iron chimney set in front of each boiler.

A small part of the rubble work charged to Account 27 should have been charged to a sewer account, but by a misunderstanding it was added to 27.

The item shown in Account 31 for pipes and fittings comprises all the material and labor expended for that purpose for conveying steam or water throughout the entire establishment. The "common pipe" comprises medium and small sizes, the "large pipe" simply large sizes of *rolled* pipe, while the "sheet iron pipe" includes all riveted work made from sheet or plate iron. The hydraulic pipe is all of special thickness, as for cranes and other special machinery using hydraulic pressure.

A copy of the list of accounts is appended to this paper for convenient reference.

Class.	House.	Shells, etc.	Brickwork.	Castings.	Pipes.
	27	28	29	30	31
Rubble work	$3,910	$132	$562	....	....
Cement	51	10	75	....	....
Sand	25	....	54	....	....
Lime	....	....	18	....	....
Water	133	....	....	....	....
Red brick	1,160	....	86	....	....
Fire brick and clay	....	....	3,286	....	....
Bricklaying	580	11	1,401	....	....
Lumber	579		166	....	....
Window frames	489	....	....	....	....
Roof iron	4,136	....	....	....	....
Shells and domes	....	23,482	....	....	....
Tubes		9,333	....	....	....
Wrought beams	....	878	....	....	....
Chimneys	....	7,384	....	....	....
Castings	235	413	..	$3,811	$858
Bar iron	93	126	....	82	88
Hardware	....	80	56	97	458
Lead	....	....	....	....	255
Sulphur	12	.. ..	....	....	51
Coal	12	49	21	....	78
Oil	....	41	....	....	45
Paint	52	117	....	13	10
Common pipe	....	....	....	....	6,815
Large pipe	....	....	....	....	4,812
Hydraulic pipe	....	....	....	....	1,636
Sheet-iron pipe	....	....	....	....	5,353
Copper works	....	....	....	....	873
Steam valves	....	....	....	....	650
Rubber	....	....	....	....	290
Common labor	126	472	55	134	942
Skilled labor	318	2,271	643	348	3,402
Teaming	....	208	150	....	....
Totals	$11,914	$45,016	$6,573	$4,485	$26,616

Total of five accounts noted, $94,604.

A. CONVERTING WORKS.

1. *Building.*—Foundations; brick work; timber and bolts in walls; roof; ovens and tracks; cupola piers; spiegel furnace piers; casting pit walls and iron coping; iron columns behind converters; window frames; hinge irons.
2. *Blowing Engines.*—Foundations; bolts and washers; air receiver.
3. *Pressure Pumps.*—Foundations; bolts and washers; accumulator; regulator with valves and platform.
4. *Cupola Blowing Engine.*—Foundations; bolts and washers.
5. *Cupola Furnaces.*—Bed plates; stacks; brick lining; spouts for leading metal with their wheels and hangers; cupola ladles and scales.
6. *Converters.*—Foundations; bottoms; tuyere boxes; bottom cars and lift; rotating gear; stacks; stack lining.
7. *Cranes.*—Foundations; bolts and washers; top guides; ladles; stoppers; oven crane.
8. *Cupola Lifts.*—Foundations; frame; hydraulic cylinders; chains; valves; buggies for iron and coal.
9. *Floor and Galleries.*—At cupola base; at cupola charging doors; behind converters; brick paving; bins and shelves for materials.
10. *Smaller Machines and Fixtures.*—Crusher; pulverizer; grinding rolls; pug mill; cinder mill; shafting, couplings, and pulleys; shaft hangers and wall plates; belts; engine and fly wheel; fan for spiegel furnace.
11. *Spiegel Furnace.*—Plates; brick lining; iron stack; damper.
12. *Lift for Melted Iron.*—Foundation; frame; cylinder and ram; car; valve.
13. *Sheet Iron Pipes and Valves.*—To regulator from receiver; to converters; to cupolas; to spiegel furnace.
14. *Hand Tools.*—For converters; for ladles; for cupolas; for engines; for cranes; for spiegel furnaces; for crushing apparatus; for bottom casting.

B. RAIL MILL.

15. *Building.*—Foundation for columns; base plates and setting; iron columns; roof.
16. *Engine and Roll Train Foundations.*—Masonry; bolts and washers.
17. *Large Engines.*
18. *Blooming Train.*—Tables; regulator; belts; floor over pits.
19. *Rail Train.*
20. *Smaller Engines and Fixtures.*—Foundations; engine for punch, etc.; punches; drills; presses; saws with engine and carriage; shafting; belts; rollers for transfer of rails.
21. *Hot Bed.*—Cold bed; strait plate; rollers from train.
22. *Hammer.*—Foundation; bolts and washers.
23. *Cranes.*—At bloom mill; to pile blooms; to change rolls; traveler in yard.
24. *Hand Tools.*—Wrenches; tongs; hooks at rolls and hammer, with runs and hangers; at drills; at press; at punch; sledges; telegraphs with tongs; buggies.
25. *Track Scales.*—Foundation.
26. *Floor Plates.*

C. BOILERS.

27. *Building.*—Foundation; timber and bolts in walls; window frames; roof.
28. *Boilers.*—Stacks and bearers.
29. *Boiler Setting.*—Foundation; fire brick work; red brick work.
30. *Castings.*—Binders and bolts; grates and frames; floor plates; ash and flue doors; rollers and plates.
31. *Pipes.*—Main steam pipe; safety valves; stop valves of all kinds (except those furnished by contract with engine); all pipes for steam or water, whether of cast or wrought iron; hangers; bolts; covering for pipes.
32. *Tools.*—Pokers; hoes; bars; steam gauges; gauge cocks; gauge glasses.
33. *Feed Pumps and Heaters.*—Foundations.

D. FURNACES.

34. *Producer House.*—Foundation; brick work; iron columns; roof.
35. *Producers.*—Foundations; red brick work; fire brick work.
36. *Castings for Producers.*—Binders and bolts; plates; hoppers; cooling tubes; grates.
37. *Gas Flue.*—Foundation; brick work; man hole plates.
38. *Furnaces.*—Foundation; red brick work; fire brick work.
39. *Castings for Furnaces.*—Binders and bolts; plates; flooring; valves; doors; bottom plates and bearers.
40. *Tools.*—Bars; hoes; hooks; short peels.
41. *Charging Machinery.*—Cylinders; valves; chains; sheaves; framing at furnaces; long peels.
42. *Chimneys.*—Foundations; base plates; bolts and washers; iron shells; brick lining.

E. BUILDING FOR OFFICE AND SHOPS.

43. *Building.*—Foundation; brick walls; roof; window frames; floor; vault with doors.
44. *Office.*—Fixtures; furniture.
45. *Laboratory.*—Chemicals; balances; fixtures; furniture.
46. *Store Room.*—Fittings.
47. *Machine Shop.*—Engine; boiler and fittings; machine tools; hand tools; vises; shafting and couplings; belts.
48. *Smith Shop.*—Forges; anvils; steam hammer; tools.
49. *Oil House.*—Oil tanks.

F. WATER WORKS.

50. *Building.*—Foundations; boilers; pumps; pipes to river and to works; tank.

G. ROLLING STOCK.

51. *Locomotives.*—Ingot cars; bloom cars; dump cars; yard wagons and carts.

H. RAILROADS.

52. *Grading.*—Wide gauge railroad trestles and tracks; narrow gauge railroad tracks; coal shoots.

I. SEWERS.

53. *Excavations.*—Brick work; pipe supports.

K. SHEDS FOR MATERIALS.

54. *Sheds for Brick.*—Lime; cement; clay; sand; coke; coal and iron at smith shop.

L. RIGGING.

55. *Pulleys.*—Ropes; derricks.

M. DROP.

56. *Frame.*—Engine.

N. GENERAL EXPENSES.

57. *Mechanical Engineering.*—Draughtsmen; office expenses; paper; instruments, etc.
58. *Civil Engineering.*—Draughtsmen; office expenses; paper, instruments, etc.
59. *Accounts at Works.*—Clerks; office expenses; books; blanks; stationery, etc.
60. *Accounts at General Office.*—Bookkeeper; clerks; books; blanks; stationery; office expenses, etc.
61. *General Office.*—Furniture; rent; incidental expenses.
62. Watchman.

O. LEVELING, ETC.

63. Grading premises, etc.

CHROMIUM CRUCIBLE CAST STEEL.*

By Sergius Kern, St. Petersburg.

Most of the crucible steel is at present prepared by melting in fireclay crucibles suitable mixtures of puddled steel, iron, steel or iron filings, with the addition of iron magnetic oxide as a flux, and ferromanganese in order to reduce the oxides of iron resulting from the oxidation of the melted metal. When hard steel, the so-called instrumental steel, is desired, the iron or iron filings are replaced by refined cast iron in the above mentioned mixtures. The bars of puddled steel before being cut into pieces (1 inch by 1 inch) are ordinarily classified by their degree of hardness; this is done by breaking them by means of a hammer. But as the puddled bars are never uniform in respect of the percentage of carbon, the production of a required percentage of carbon in cast steel is a rather difficult task. The following tables show to some extent the fluctuation of the percentage of puddled steels obtained by the ordinary way and by rolling the puddling blooms into bars. The combined carbon was determined by the Eggertz calorimetric method. The normal steels were tested by the oxidation of the carbon of steels by chromic acid, and next collecting the resulting carbonic acid in a potash apparatus. It must be mentioned that puddled steel for the preparation of crucible cast steel is always puddled with wood previously dried in suitable furnaces, in order to avoid the use of coal, containing more or less sulphur. The use of such fuel certainly increases the price of steel blooms.

TABLES OF ANALYSES OF STEEL BARS.

Sets of Hard Steel Bars. Carbon.			Sets of Soft Steel Bars. Carbon.		
Bar.	I.	II.	Bar.	I.	II.
A	0·77	0·58	A	0·18	0·18
B	0·77	0·58	B	0·18	0·22
C	0·51	0·31	C	0·22	0·18
D	0·58	0·31	D	0·22	0·18
E	0·58	0·31	E	0·47	0·18
F	0·79	0·31	F	0·27	0·18
G	0·51	0.58	G	0·47	0·27
H	0·79	0·51	H	0·18	0·18
I	0·51	0·51	I	0·47	0·18
J	0·51	0·58	J	0·22	0·22
Mean near to	0·63	0·46	Mean near to	0·29	0·20

* *The Chemical News.*

These analyses are only a few representatives of analyses of such kinds of bars in my hands; they clearly show why the metallurgist is always blind in mixing raw materials for the preparation of cast crucible steel. The use of Bessemer or Siemens-Martin steels avoids this difficulty very well; these steels are far cheaper than puddled steels.

The following experiments were made in order to prepare solid steel without blow-holes by the crucible process, which would give a good resistance and a proper elongation. The use of the rather dear ferromanganese was avoided, and the only substitutes of it in the new process are ground chrome ironstone ($FeO\ Cr_2O_3$) and limestone previously calcined.

The annexed tables, A and B, show the composition of raw materials and receipts for the preparation of chromo-steel for various purposes. This steel is especially suitable for steel-casting direct in earth-molds.

A. ANALYSES OF RAW MATERIALS FOR CASTING STEEL.

(*a*) Bessemer Rolled Steel Bars.

	I. Per cent.	II. Per cent.		I Per cent.	II. Per cent.
Combined carbon.	0·100	0·250	Sulphur.....	traces.	0·005
Silicon.....	0·006	0·010	Phosphorus ..	0·010	traces.
Manganese.....	0·020	0·030	Copper.....	none	none

(*b*) Siemens-Martin Rolled Steel Bars.

	III.	IV.		III.	IV.
Combined carbon,	0·400	0·600	Sulphur.....	0·010	none
Silicon.....	0·020	0·020	Phosphorus...	traces	0·001
Manganese.....	0·030	0·130	Copper.....	traces	none

(*c*) Iron.

Combined carbon.....	0·12	Manganese.....	traces
Graphite.....	traces	Sulphur.....	none
Silicon.....	0·02	Phosphorus.....	none

(*d*) Refined Cast-iron.

Combined carbon.....	4·25	Manganese.....	0·04
Graphite.....	0·10	Sulphur.....	none
Silicon.....	0·03	Phosphorus.....	none

(*e*) Chrome Ironstone.

Chromium oxide.....	65·51	Foreign matter.....	2·60
Ferrous oxide (FeO).....	31·65	Copper.....	none
Sulpur.....	none		

(*f*) Lime Calcined.

Calcium oxide.....	90·750	Sulphur.....	0·010
Silica.....	1·500	Phosphorus.....	0·005
Iron Oxide.....	2·750		

The chrome ironstone and limestone are calcined and next ground. The raw metallic materials are used for preparing the steel in the form of pieces of a square form (1 inch by 1 inch). Raw products having closely the above-mentioned composition may be used for the further receipts for the preparation of cast steels.

B. RECEIPTS FOR THE PREPARATION OF CAST STEEL.

	I. Kilogrms.	II. Kilogrms.		I. Kilogrms.	II. Kilogrms.
Bessemer steel, No. I.	24·00	10·00	Chrome ironstone...	0·75	0·65
" " No. II.	5·00	22·00	Limestone.....	0·25	0·35
Iron.....	5·00	2·00			

The percentage of carbon in the received steels is about 0·20 to 0·25 in steel in No. I., and 0·45 to 0·55 in steel in No. II.

	III. Kilogrms.	IV. Kilogrms.		III. Kilogrms.	IV. Kilogrms.
Martin steel, No. III.	20·50	2·00	Chrome ironstone...	0·75	1·25
" No. IV.	4·50	19·00	Limestone.....	0·50	0·75
Refined cast iron...	8·75	12·00			

The percentage of carbon in the received steels is 0·80 to 0·90 in steel No. III. and 1·0 to 1·3 in steel No. IV.

The mixture for steel-preparing is placed into previously heated fireclay crucibles; the chrome ironstone and the lime are placed on the bottom of the crucible, and next it is filled with the other materials entering into the composition of the receipt. Ordinary coke-crucibles or Siemens gas crucible furnaces are used for the operation.

The resulting four numbers of steel are quite sufficient for nearly all purposes, as following:

Steel No. I., for steel plates, rifle barrels.
" II., for machinery parts, cannons, tires. axles.
" III., for instruments, cannon rings, saws.
" IV., for chisels, planing tools, etc.

The annexed table shows the mean result of the mechanical tests of the above-mentioned steels. The steel ingots obtained were hammered to test bars, which, after forging, were cooled in water. From every number of the cast steels mentioned in the tables, six different specimens were examined.

Cast steel. No.	Percentage of carbon.	Tons per square inch. Began to stretch.	Breaking weight.	Elongation in inches.
1.....	0·25	25·3	48·1	1·35
2.....	0·49	26·1	49·2	1·24
3.....	0·95	24·8	52·3	1·13
4.....	1·20	27·1	54·7	0·62

The samples of steels contain 0·08 to 0·25 per cent. of chromium; as ordinary hard steels contained more chromium than the soft specimens.

In preparing steel by this process, the use of manganese alloys is avoided, which in many cases, while reducing the iron oxides, give steel containing phosphorus and sulphur, as these elements are found in ferromanganese very frequently. By the new process cast steel of a very good quality may be had at a very moderate price, as the Bessemer and Martin steels are at present cheap and carefully prepared.

OBOUCHOFF STEEL WORKS.

A SPECIMEN OF TANTALITE OR COLUMBITE (theoretical composition, $FeO\ MnOTaO_3CbO_3$) has been found in Alabama by Prof. Eugene A. Smith, the State Geologist, and forwarded to Prof. J. Lawrence Smith, Louisville, Ky. This is the first instance of the discovery of this mineral in the United States. Its specific gravity was over 7·2, and its surface indicated partial decomposition.

MINING NEWS.

THE MISSOURI LEAD AND ZINC MINES.

The *Granby Miner* says: "Some very promising developments have recently been made on Poor Man's Point, close to the line between sections five and six, and at the head of Gum Spring branch. Poor Man's Point has a reputation for heavy deposits of silicate zinc ore, but has not been worked to any advantage on account of water. In an old shaft, 65 feet deep, they recently struck up a face of mineral four feet wide and five feet in height."

"The indications are that, in a little time, a large increase of miners will be at work in the vicinity of East Point. As we have repeatedly stated, it is the most promising locality in the Granby mines, and, we believe, in the Southwest."

Erection of Zinc Works at Pittsburg.—The Joplin *News* says: "We are reliably informed that a contract has been closed between the Joplin Railroad Company and Messrs. Lanyon Bros., of La Salle, Ill., under which the latter company will at once proceed to erect extensive zinc works at Pittsburg, on the Joplin Railroad. It is the intention of the Zinc Company to have the works completed and in operation by spring. This will, no doubt, be gratifying intelligence to the miners of Joplin, and all others interested in her welfare, as these works may be regarded as a forerunner of others. While a single establishment of this kind may not be the means of directly advancing the price of zinc ore in this market, it will at least give to our city the trade of its employes, and will probably give employment for a time to Joplin mechanics; but what we hope for, and confidently expect, as a result of these works, will be the establishment of still others, when competition and low freight rates will surely stimulate the zinc market, and give our miners every dollar that their ore is worth; and when it is taken into consideration that the zinc companies who locate here have the advantage of saving from $50 to $75 per car on the ore over their Illinois competitors, while they will be able to lay their spelter in the Eastern markets at about the same rates of freight that they are now paying from La Salle, it will be seen how much more they could safely pay for zinc ore than they are now able to do.

"The loss and waste of transporting our zinc ores three or four hundred miles, with all the rock, gravel, dirt and impurities they contain, is enormous, and the old companies that continue it must, in the end, go the wall, or make a change of base. They cannot stand out against the cheap ores of Granby and Joplin, and the cheap coal of Kansas, that are brought together by a short railroad of 20 to 25 miles. The Messrs. Lanyon & Co. only need to take one step more to insure the cheapest possible reduction of zinc ore to spelter. They should also locate a reducing furnace at the zinc mines, and make round trips, delivering coal at one furnace and zinc ore at the other."

The Pittsburg Mining Company.—"The mines of this company are located about twelve miles south of Joplin, adjoining the Dayton mines, controlled by the Dayton M. S. Co. The Pittsburg Mining Company has reached in its pump-shaft the depth of 84 feet. At the depth of 40 feet it passed through two feet of solid rosin jack; at 48 feet, a four-foot opening containing good mineral, below it, some rotten, then 32 feet of hard blue flint. Between the flint they find thin layers of tallow clay the whole width of the shaft. The water is kept under good control, raising about 2 feet an hour."

The *Plevnena Lead Mine*, near Perryville, Mo., was discovered in 1876. It consists of two vertical veins or lodes of ore, five feet deep by five in width, running parallel with each other, at a distance of 120 feet, and at one point they are within 10 feet of the surface. The ore yields 75 per cent. in lead. Sufficient work has been done on this mine to warrant the erection of smelting works.

It has been discovered that these mines have been worked before, in some remote pre-historic age.

The Christian County Mines.—The *Monitor Leader* says: "Preacher Hanks, who is now superintendent of the Onstott mines, says he now considers the prospect at the mines better than at any previous time; the only drawback being the low price of mineral. The companies are able to pay only $14.20 per thousand pounds, which is very small pay, when we consider that the expense of hauling and washing and other expenses come out of that. If the mineral brought a better price, much more would be lifted than the miners are now disposed to take out. There is enough mineral at the Robertson & Yochum smeltery to keep the furnace running two or three weeks. The wages of the smelters have been reduced from $2 to $1.50 per charge. Two charges can be made per day."

The Short Creek Mines.—The *Galena Miner*, of the 20th of November, gives very encouraging reports from East Galena, where J. N. Sweeny, the Labette shaft, Esp & Miller, in the Swede shaft, Moore & Harper, the Nevada shaft, the Virginia shaft, Mitchell, on Haughey tract, McKee, Bing & Cushman on lot 27, Bloomington lands; Burnstine, Tustin & Howard, on lot 26, Bloomington lands, and Mr. W. G. McDowell, of the McDowell lands, are all doing well. East Galena turned in 10,000 last week. The Bonanza M. and S. Company received over 75,000 pounds of mineral last week. Miners from those diggings inform us that mining operations have been resumed in a number of shafts that have stood idle for some time, owing to the low price of mineral. The bonanza smelter now runs two eyes and is doing a good business."

Quotations.—The *Joplin Herald* gives the following prices now prevailing for lead and zinc ore: "Neutral mineral, 1,000 lb., $18 to $19.50. Company's mineral, 1,000 lb., $13 to $15. Zinc blende, per ton, 1st grade, $16. Zinc blende, per ton, 2d grade, $12 to $14. Zinc blende, per ton, 4th grade, $6 to $8. Zinc silicate, per ton, $8 to $10.

MONTANA.

North West.—A company has been formed to work the bed of the Missouri River from French Gulch down. The ground is reasonably supposed to be very rich, but it is difficult to work. A new invention, recently patented in California, and consisting in the main of a floating dredge, is to be built and placed on the work. Our latest advices from California indicate that this invention is *not* a success.

One of the recent veins from the Aurora Lode (Silver Star District) yielded 385 ounces of gold, worth about $7,000. The Green-Campbell mill, at the same place, is running steadily, with 28-stamps, on Broadway ore.

Herald.—During the first half of November the Hope mill, at Phillipsburg, produced $16,000 in silver bullion.

From 60 tons of Little Giant ore (St. Louis), $4,200 was stamped out.

On November 16, the Highland Flume Company (Alder Gulch) cleaned up 800 ounces of gold.

The Helena U. S. Assay Office calls for $10,000 more to complete it.

A discovery of very rich copper ore from the vicinity of Cave Gulch is reported.

Work is now progressing on the Utah Northern Railroad. The road is to be extended into the valley of the Snake River, Idaho, towards Montana.

Confederate Gulch.—The Keatings' mill, at Radersburg, is again in operation.

A new tunnel is to be driven under the Hampton bar this winter.

Butte Miner.—The Lexington is at work again. It is now supplied with sufficient hoisting capacity to sink 500 feet.

The La Plata Company have purchased the old Highland mill, and will remove it to Butte.

The Olin concentration works have closed for the winter.

The first clean-up of the new Walker mill, on November 8, produced a $2,000 silver bar.

Work on the Silver Bow placer and gulch diggings has been closed for the winter. The arastras in Vipond district, having successfully handled ores of that camp, will be run all winter, with steam power if necessary.

The Pyrenees lode (Georgetown) continues producing well. $6000 in gold was recently taken from 210 tons. A tunnel is now being run to strike the vein 65 feet below the present workings, where a fine body of ore is opened. The company are negotiating for a mill.

COLORADO

Register.—Gilpin county's gold and silver product for October was $207,000.

In this district are 19 quartz mills with 595 stamps engaged in crushing ore night and day, handling 450 tons of ore every twenty-four hours.

The Boston and Colorado Smelting Works are smelting 50 tons of ore daily. This establishment has lately been enlarged one-fourth.

The Miller and Richman mill at Black Hawk is running only 25 stamps, one-half of its full number, but the others will probably be in motion soon.

The Golden Smelting Works are receiving large quantities of Gilpin ores of a higher grade than usual. Their business is steadily increasing as new mines are opened here and elsewhere.

The Pyrenees mine, on Quartz Hill, has been making a splendid record this year.

Fullerton, Clinton, Mosley & Co., continue to keep from 68 to 78 stamps at work night and day in crushing ore from their part of the Gunnel lode. The mill gold has been footing up from $15,500 to $16,700 monthly. One hundred men are at work in the mine, whose lowest workings are down 700 feet below the surface.

The Gregory vein is looking better in the bottom of both the Briggs and New York and Colorado mines. The shafts of both are being sunk, and good ore is found in the 700 foot level of the latter. The Briggs shaft has attained a depth of close on to 910 feet. Both mines combined keep two mills and 90 stamps at work, beside the ore products of tribute workers and smelting mineral, and employ about 160 men. The monthly product combined is something like $20,000.

The Bobtail is the largest producer in the county, employing some 200 men, two mills and 95 stamps, with a daily product of 75 tons of ore. Three other properties are operated now on this same lode. These employ some 30 or 40 men altogether and produce several thousand dollars monthly. The entire lode probably produces from $25,000 to $30,000 monthly.

The Monmouth and the West Kansas properties are being opened to such an extent that the fifty-two stamp mill is found to be insufficient to handle their steadily increasing ore product. Consequently the Sullivan mill has been added. It will be employed in crushing ore from the West Kansas and any custom ores that may be brought to it.

The Kansas in both properties was never in better pay than now. The ore body is of vast extent downward and westward from the main shaft, and is best in the lowest workings. Sinking and drifting are continued night and day, and the shaft is already over 800 feet deep. A production of $20,000 monthly is expected soon from the entire 1,000 feet.

Mr. Standley is busily engaged in putting the shaft of the California in working order, also lately started up after years of idleness.

The Alps and Mackie mines, which were lately reopened for the Cleveland Company, are a little further advanced towards working order. Drifting, sinking and a crosscut keep quite a force of men employed.

Colonel Doe commenced work on the Wood lode some time ago.

The Fourth of July, which was started up in the summer after years of abandonment, has been paying for many weeks.

Richard Mackay employs quite a force of men in the Kent County mine, which is 550 feet deep. About 27 tons of ore are broken, hoisted and milled daily, keeping 37 stamps at work. The monthly product of gold has ranged from $6,000 to $11,000 since midsummer.

GEORGETOWN AND VICINITY.

Courier.—Some encouraging developments have recently been made on the Empire City lode, on which four beds have been opened. The Lewis, one of the old Empire mines, has been re-opened. The Carondelet and Golden King, in the same district, are also under work. The new 16 stamp mill of the Pioneer Company is now nearly ready for work. Raw amalgamation is the process. The Pioneer lode is opened at a depth of 75 feet by a crosscut tunnel, and something over 200 feet of tunnels have been driven, showing a fine vein of pyrites 2 to 3 feet wide, carrying from 5 to 8 ounces per cord. A shaft is soon to be begun at the intersection of the tunnel and vein.

The contracts let this season on the Burleigh are approaching completion. When finished, the total length will be 2,300 feet. Work will then be suspended in the heading for the winter, but drifting will be continued on the New Era and Rider lodes. Both these veins are doing well. Some alterations and improvements are being made at the mouth of the tunnel, and, in another year, the fine water power will doubtless be placed in harness.

The Anglo-Saxon is being pushed down with continued gratifying results. Mill runs from this mine are seldom less than 500 ounces.

The fire in the Terrible mine was confined to the old and worked out stopes, and caused less than $4,000 in damage. A quantity of loose rock fell through the burned stulls into the engine chamber, and somewhat damaged the machine and hoisting gear. All injuries are now repaired.

The tunnel begun some time ago to cut the Little Emma on Democrat has met the lode, and been connected with other workings. Production will now be resumed.

The Silver Queen Concentrating Works, after several months of refitting, are at last satisfactorily at work on Terrible ore. The capacity is 30 tons per 24 hours. The plant consists of crusher and rolls (Blake), 4 combination jigs for the larger sized mineral, and 2 Rittinger tables for slimes.

The Clear Creek Company are adding two Bruckner cylinders and four leaching tubs to their already extensive mill. The mill is running wholly on custom ore. The concentrating department handles 25 tons daily. The leaching department, which is intended mainly for lower grade concentration, is working very satisfactorily.

Boulder County.—Sunshine Courier.—The shaft on the Melvina is 270 feet deep. The mine maintains a steady and fair yield, and is now utilizing the product of the entire vein, all low grade minerals being concentrated.

An additional 50-foot contract has been let on the Atchison adit. When completed the length of this opening will be 300 feet.

Notes.—A temporary suspension of work at the Nederland Frue Concentrating mill occurred lately, owing to a stoppage at the Trojan mine. The mill is now running again on Caribou third-class.

The First National mines are working from 30 to 40 men continuously. The mill and Frue belts are kept running continuously. The first load of concentrates from the former came down the cañon on November 28.

It is reported that a $7,000 profit was secured from the Caribou last month. Another 100-foot contract has been let on the main shaft, which will carry it down to a depth of 700 feet. Nearly 100 men are at work in and around the property, and, owing to the careful and intelligent handling experienced under its present American management, it is said to be in better condition than at any previous time.

A very fine body of ore has been struck at 210 feet in the Monitor. A steam pump is now being put up.

The Pomeroy Concentration Works, at Ward, are completed, and are reported to have made a very satisfactory run on a test lot of Bowery ore.

Church's new concentrating mill (Frue vanners) at the Smuggler Mine is a most pronounced success. It has a capacity of 12 tons daily (4 belts), and is confining itself exclusively to third-class ore, of which several thousand tons have accumulated during the last year while working the mine.

The Golden Age Company, at Jamestown, are fitting up an amalgamating mill to handle the already large production from their lode.

The machinery for the Washington Avenue Mine (from Frazer, Chalmers & Co.) has arrived at Boulder, and is on its way up the Cañon.

SAN JUAN.

Silver World.—The machinery for the Dow and Waters Lixiviation Works has been brought at last to the mill, and is being set up.

A force of men have been set at work on the Chicago lode.

Work has ceased for the season on the Virginius lode (Sneffel's).

Six leasing parties are at work on the Belle of the West, and will push work through the winter.

The litigations over the Ocean Wave Mine having been temporarily settled, work has been resumed under the charge of a receiver.

ARIZONA.

The first stock dividend of the Silver King mine was paid on November 15—50 cents per share. This mine is capitalized in 100,000 shares. It has produced since its discovery, from first grade shipping ore, above $280,000 net profit; while doing this, the mine has been extensively developed, and some expensive hoisting and concentration works built for its use. It is reported now to show nearly $2,000,000 in sight and on the dumps.

The McCracken mine is shipping 150 tons daily.

When the new mill at the Peck mine is completed, the production is expected to amount to $100,000 monthly.

The old Gila River placer mines, now that attention has been once more called to them by the organization of a large Californian company, upon an extensive piece of segregated ground, are being reprospected at various points, and with great success. The bed-rock is found to be very rich, and the banks and bars profitable ground to work.

The Champion mill is completed, and is now crushing 20 tons daily. It is a steam piston mill, having two stamps.

The Castle Dome lead veins are maintaining a steady yield, and developing well. The veins are large, and carry a good quantity of ore. About 10 tons daily is the present yield of the district.

The smelting works of George Greene & Company closed for the season on last Friday night, after having made one hundred and fourteen days' run since the blast furnace was first started on the 30th of June last. The first run made was a continuous run of fifty-two days. The furnace was then shut down for ten days, when it was again started up and run for thirty-two days, when it was shut down for repairs, which were made, and the furnace started in four days, and the last run of thirty-one days made. The bullion product has averaged three tons per day. The lowest average of a ten-ton lot of bullion was two hundred ounces in silver to the ton, while the highest average of a ten-ton lot was over three hundred and thirty ounces in silver to the ton. The average of the thirty-four ten-ton lots will not fall below two hundred and sixty ounces to the ton. The coin value of this product for the silver that it contains, reaches $107,640, while the lead and gold which it contains will bring its value in St. Louis up to over $150,000. The active members of the firm here are deserving of much credit for the successful manner in which its affairs have been managed during the past season. Many improvements and economies were introduced this season over last, and the experience this year has suggested many more that will be introduced another year.

The ore supply next spring will be double, and perhaps triple what it was last. The mines on Hazelton Mountain, from which the greater portion of the ore treated this year has been taken, are being more extensively worked this winter than ever before, and are now in shape to be worked at greater advantage. The Aspen is turning out more ore now than ever before, and ore of higher grade. The mines tapped by the Susquehanna tunnel are turning out more and better ore than ever, while in every locality throughout the mining section tributary to Silverton, the most flattering and encouraging reports are coming.

QUARTZ MINING IN BRITISH COLUMBIA.

The partial giving out of placer mining in British Columbia has had the effect of decreasing the population of that colony. To offset this, the Colonial Government offered a bounty of $15,000 for the first experimental result of quartz mining. Parties in San Francisco interested in some mining properties in Cariboo sent up Mr. Harper, formerly connected with the North Star Mine in Grass Valley, and who is an expert in quartz mining, to develop the interests there. The result of the experimental crushing of 40 tons of rock was $342, or nearly $8.50 per ton of rock. The mill is located on William Creek, in Cariboo, and the experiment is looked upon as one of great importance to British Columbia. Thus far all the gold veins found there have been very narrow, and hardly worth the working.

Messrs. Meacham and Nason obtained $1,438.59 from 3 tons of sulphurets put through the mill last week.

The Bonanza Tunnel is now fairly on quartz, which is improving as they approach the hanging wall.

The Enterprise Company have let a contract for 270 feet of tunnel at $7 per foot.

Articles of incorporation of the Cariboo Quartz Mining Company, limited, capital $60,000, divided into 30,000 shares, were filed with the Gold Commissioner on Monday last. An assessment of 10 cents per share has been made.

The *British Colonist* has reports dated Barkerville, November 12, which say: "Two assays from different pieces of rock from the Bonanza ledge were made at the government office to-day, which averaged $90.21 to ton.

NOTES.

AN INTERNATIONAL EXHIBITION IN ITALY.—A dispatch from Milan says it is announced that an international exhibition will be held there in 1879.

DISTRESS AMONG CORNISH MINERS.—The London *Times* states that the distress among the mining population of Cornwall has become so great as to require an organized charitable movement for their relief.

PREPARATION OF RHEA FIBER.—In 1870 the government of India offered a prize of £5,000 to the inventor of the best machine or process for the preparation of the Bohmeria nivea, or Rhea grass. The President in council now renews the offer.

ABANDONMENT OF THE OHIO CANAL BY THE LESSEES.—The Ohio Canal has been abandoned by the lessees and thrown upon the hands of the State, and the feeling, along the main line and its branches, among coal men and grain dealers is very bitter.

REDUCTION OF WAGES AT WILKESBARRE, PA.—A reduction of ten per cent. went into effect on Saturday at all the mines operated by Charles Parrish & Co., around and about Wilkesbarre. On the part of the firm, a like reduction of ten per cent. is made on all supplies, excepting powder, and on house rent and coal.

LARGE COAL SHIPMENTS ON THE OHIO RIVER.—LOUISVILLE, Ky., Dec. 5.—6,000,000 bushels of coal will have arrived and will go south of here within the next two days if the river does not fall too rapidly. Southern steamers due up will be obliged to remain at the foot of the canal till the blockade is removed. The coal fleet is the largest for years.

TO REMOVE TIN FROM COPPER.—The removal of tin from copper vessels coated therewith can be easily accomplished, according to Prof. Bottger, by immersing the vessel in a concentrated solution of sesqui-chloride of lime. In a very few moments the tin is removed from the copper, and nothing remains to be done but scour the latter with moistened sand and dilute hydrochloric acid to obtain a perfectly clean surface.

LABOR TROUBLES.—A strike in the Mahoning, Shenango, and Tuscarawas coal regions is anticipated, miners from the latter valley having visited those of the other two recently, with a view to organizing for general suspension of mining operations.

LONDON, December 3.—The Northumberland colliery proprietors will to-day issue a fortnight's notice to their miners of a twelve and one-half per cent. reduction in their wages.

THE SALT SHIPMENTS OF SAGINAW.—The total shipments of salt from Saginaw during the season aggregate 1,110,000 barrels by water, of which the Michigan Association are credited with 1,029,569 barrels up to the 23d of November. The past season has been a moderately prosperous one for the lumber and salt trades. The stock of lumber on the docks at the close will aggregate about 175,000,000 feet, of which a large quantity is sold, and about 80,000,000 feet less than the amount on hand at the close of navigation in 1876.

COMPARATIVE STRENGTH OF WOOD AND CAST-IRON.—Herr Hirn has been conducting a series of experiments in Germany on the comparative strength of wood and cast-iron in their different applications, and finds that in a great number of cases the former has the advantage. Prof. Hirn finds the strength of wood to be in direct ratio to its density, and this strength is increased by immersing the pieces of wood in linseed oil, heated from 185° to 212° Fahr., and letting the wood thus immersed remain for two or three days, or until partially saturated.

IF THE ACID PHOSPHATE OF LIME, as described by M. Sidot, which crystallizes under the influence of heat, is exposed to a very high temperature, it becomes perfectly vitrified, apparently descending to the condition of tri-basic phosphate of lime, 3 CaO, PO_5, and losing some of its elements. It has great refactinp power, its index being 1·523, and its density 2·6. It may be worked into lenses, prisms, etc., like common glass, and possesses a luster equal to that of strass. It resists cold acids, though it is attacked by boiling acids and potash.

A NEW ELECTRIC BATTERY.—According to *Les Mondes*, M. Maiche has made a battery of very simple construction. He claims that it is energetic, constant with a single liquid, never polarizing, always ready, without change in the points of contact, and using only what is theoretically indispensable. It possesses an electro-motive force three-fourths as great as the Bunsen cell, and deposits a kilogram of copper at a cost of less than a franc, or nearly an equivalent of copper for an equivalent of zinc. It serves equally well for furnishing powerful currents or currents of long duration.

A NARROW RAILROAD.—The narrowest railroad in the world is between North Billerica and Bedford, Massachusetts, a distance of eight and a half miles. The track is ten inches wide. The engine and cars are proportionate with the width of the track. The passenger cars have an aisle in them, and a seat on each side, instead of two seats, as in a full-grown car. There are thirty seats in each car. The train runs twenty miles an hour. One grade on the road is one hundred and fifty-five feet per mile. The trains consist of two passenger and two freight cars and an engine. The cars and engines have air brakes and all the modern improvements. Ordinary cars weigh four times as much as these little coaches. The cost of the road was $4,500 per mile, and the running expenses are about one-fourth that of ordinary trains.

NEW USES FOR IRON SOUGHT.—A commission has been appointed by the Belgian Government, consisting of twenty prominent civil and mining engineers, iron manufacturers, architects, and railroad officers, to enlarge the field for the consumption of iron. The report of the Minister of Public Works, in accordance with which the commission was appointed, urges the investigation particularly as likely to increase the demand for the products of the Belgian iron works, which have long been suffering for the want of sufficient orders. The Minister mentions that in his department already experiments have been made in renewals of wooden railroad ties by an iron substructure, with hopes of success, and he mentions as worthy of attention the substitution of iron for wood for frames, floor beams, cranes, scaffoldings, etc., in building, for supports, etc., in mines, etc.—*Railroad Gazette.*

MICROSCOPIC EXAMINATION OF ROCKS.—A short time since Father Renard contributed to the Scientific Society of Brussels a paper on the microscopic analysis of rocks and of mineral cavities. Referring to the latter portion of his subject, and to the fact that cavities are often found in crystals, containing liquid, with a movable bubble, he states that by warming the crystals carefully the bubble is found to disappear at a temperature of about 300° C.—572° Fahr.—which is regarded as the probable minimum temperature at which the liquid was inclosed and the rock solidified. Petroleum, sea-salt, and liquid carbonic acid, as well as water, have been found in these cavities, and the supposed temperature of consolidation has been confirmed in various ways. Empty, vitreous cavities are often found, showing that, while quartz and granite rocks have been deposited from watery solutions, porphyries, trachytes, etc., have been fused.

THE COMPASS PLANT.—It has long been known that the western plant growing on the open prairies of America, and known as the *Silphium laciniatum*, has the property of turning many of its leaves nearly north and south, and hence the name "compass plant." It is also called "rosin weed," from its copious resinous juice. In order to determine to what extent this alleged polarity exists, C. E. Bessey, of Ames, Iowa, has, says the *Scientific American*, made a large number of accurate observations, which he reports in a late number of the *American Naturalist*. Out of 93 observations, 54 were found which pointed more or less east of north, and 39 more or less west. Of the 54 which pointed eastwardly, 18 were within 5° of north, 8 more within 10°, 7 more within 15°, 5 more within 20°, and 3 more within 25°, leaving only 14 leaves which diverged more than 25° from due north. Of the 39 which pointed to the west of north, 9 were within 5°, 5 more within 10°, 3 more within 15°, 7 more within 25°, and 7 more within 35°, leaving only 8 which diverged more than 35° from due north. Its polarity is fully established.

ACRES OF COAL AFLOAT.—The amount of coal shipped from Pittsburg to ports on the lower Ohio and the Mississippi on the present high water gives some idea of the vastness of our internal commerce. In a little over 24 hours, 8,344,224 bushels of coal left the harbor of Pittsburg. The bushel being 76 pounds, this would be 317,081 net tons, requiring a fleet of 51 steamers or tow-boats, 201 coal boats, and 338 coal barges. On the basis of 100,000 bushels to the acre of mine surface, there would be 83⅓ acres of coal, and the boats and barges would cover an area of about 45 acres, so that each steamer would tow, on an average, about an acre of boats and two acres of coal, as measured in the vein. The towing is not by line, with the boats following after the motor, as the term would seem to imply. With a tow of, say, 12 boats or barges, one would be lashed to each side, while ten would be placed in front, five long and two wide, each barge being about 130 by 24 feet. This mass of boats is firmly lashed together, the steam tow-boat in the rear, and the flotilla is propelled ahead of it. This system of towing began in 1850, the Lake Erie making three trips with four barges carrying 16,000 bushels. Before this time, all the coal was floated down the river in large flat-bottomed boats, propelled by muscle and tide. Each boat contained 15,000 bushels, and were "run" to their destination in pairs.—*Iron Age.*

WIRE FOR THE GREAT BRIDGE.—The Executive Committee were authorized at the last meeting to solicit proposals for both kinds of steel for the wire rope suspenders, and it was their report on this subject that led the board into secret session on the 3d of December. The specifications call for 325,000 pounds of wire rope, making 70,000 lineal feet in all. There are two sizes required, one measuring 1⅝ inches in diameter, weighing 4½ pounds to the lineal foot, and having a breaking strength of not less than 180,000 pounds; the other measuring 1¾ inches in diameter, weighing five pounds to the lineal foot, and having a breaking strength of 200,000 pounds. The attention of the members of the board was called to a gnarled, broken, and twisted suspender rope, the ends of which were fastened in the heavy iron rope sockets. This specimen was made at the factory of Roebling's Sons & Co., by the direction of Chief Engineer Roebling. It was 1⅝ inches in diameter, and had been tested by the Keystone Bridge Company of Pittsburg. It was broken under a strain of 197,500 pounds, the required strength being 180,000 pounds. The proposals which had been received for the wire rope were from J. Lloyd Haigh, the present contractor for cable wire, who bid eight cents a pound for crucible steel wire; from Copeland & Bacon, who bid twenty cents a pound for either Bessemer or crucible steel, and from J. A. Roebling's Sons & Co., for Bessemer steel at seven cents a pound, and for crucible steel at nine cents a pound. The arguments used in favor of Bessemer steel were that it answered every purpose for the wire rope, and that it could be more easily twisted into a rope. The board resolved, by a vote of 15 to 2, to adopt Bessemer steel for the wire ropes, and to award the contract to J. A. Roebling's Sons & Co., at seven cents a pound, making the amount of the contract $22,750. Mr. W. A. Roebling, the Chief Engineer, who prepared the specifications for the contract, is a member of the firm that obtains the award. The bids for 1,548 wrought iron cable bands, and for 1,232 cast iron wire rope sockets, were referred to the officers of the bridge company with power to make the contract. The contract for the parapet stone for the bridge approaches was awarded to the Concord Granite Company for $49,754.40.

THE MINERAL WEALTH OF TURKEY.—The Grand Vizier is doing his best to create new resources, but he is nearly at his wit's ends. As a last expedient, he proposes to lease the working of the coal mine at Heraclea, on the Black Sea, in security for a new loan he is trying to negotiate. This mine produces a good coal, and, as it lies near the sea, there is but little difficulty in the transport of the coal. The Turks have never been successful in mining operations. They have but few men of practical science, and then there is so much rascality among their officers that there is but little net revenue from such undertakings. They are too jealous of foreigners to concede their mines to them. The empire abounds in mineral wealth of all kinds, particularly Thessaly, Bosnia, and Asia Minor. On the slopes of Olympus, in the vale of Tempe, an English company has for many years been engaged in mining operations, chiefly among the silver and gold deposits imbedded in the fanes of this rendezvous of the gods of Grecian fable. This is the only foreign company of any note that has been able to obtain a valuable concession in the mineral districts. Bosnia abounds in copper, lead, zinc, silver and iron of the first quality. Should it fall into the hands of Austria, as it is likely to do in the settlement of the Eastern question, it will prove a source of great wealth to that government. It is the opinion of a celebrated Russian scientific writer, who explored Asia Minor in detail some ten years ago, and who published the results of his survey, that the sands of the Pactolus, if properly worked, would afford from the accumulated deposits it has piled upon its shores a rich yield in gold, if not as great as it did to Crœsus, yet in quantities that would astonish the world. At various epochs the Pactolus has revived its fame as a gold-bearing stream. The grains of the precious ore found in its bed and on its shores are, no doubt, triturated from the quartz rocks in Mt. Tmolus, where lie its foundations. In the time of the Lydian kings the gold treasure of the Pactolus made Sardis the richest city of the Eastern world. Shafts sunk in the bowels of the mountain and crushing mills after the California pattern might render the Pactolus and its mountain region as famous as in ancient times. But this will never happen under the slothful, unenterprising domination of the Turks.

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STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative Statement for the week ending Dec. 1, and years from Jan 1st.

Tons of 2,240 lb.	1877. Week.	1877. Year.	1876. Week.	1876. Year.
Wyoming Region.				
D. & H. Canal Co.	75,519	1,689,762	58,306	1,827,783
D. L. & W. RR. Co.	72,557	1,793,034	63,897	1,785,356
Penn. Coal Co.	24,494	957,148	27,200	1,007,830
L. V. RR. Co.	‡16,607	834,083	†36,192	867,942
P. & N. Y. RR. Co.	‡846	40,990	†1,967	23,226
C. RR. of N. J.	47,567	1,220,158	33,536	1,258,595
Penn. Canal Co.	*	340,231	3,551	407,522
	230,590	6,875,406	224,649	7,178,254
Lehigh Region.				
L. V. RR. Co.	‡56,148	3,078,594	†141,240	2,616,576
C. RR. of N. J.	34,242	1,388,118	21,869	1,295,597
D. H. & W. B. RR.	2,113	31,041	....	40,438
	92,503	4,497,753	163,109	3,952,611
Schuylkill Region.				
P. & R. RR. Co.	167,306	6,283,272	134,273	4,596,805
Shamokin & Lykens Val.	11,504	665,562	†37,184	889,975
	178,810	6,948,834	171,457	5,486,780
Sullivan Region.				
Sul. & Erie RR. Co.	‡350	18,762	†603	30,051
Total	502,253	18,340,755	559,818	16,647,696
Increase	....	1,693,059	....	....
Decrease	....	....	....	....

The above table does not include the amount of coal consumed and sold at the mines, which is about five per cent of the whole production.

* This report was not received this week.
† For two weeks ending December 2.
‡ For five days ending Nov. 30.

Receipts and shipments of coal at Chicago, Ill., for the week ending Dec. 1, and year from January 1:

	Week. Tons.	Year. Tons.
Receipts	61,884	1,632,677
Shipments	7,562	341,210

Coal shipped from Seattle for month of October, 6,257 tons. Total from January 1, 1877, to November 1, 1877, 37,157 tons.

The decrease of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Pennsylvania, Railroads amounts to 156,300 tons, as compared with the corresponding period in 1876.

Perth Amboy business:

	Tons.
Received for the week	24,496
Shipped for the week	29,247
On hand Nov. 30	93,719

Coal Cleared on the Canals of the State of New York from Nov. 23, to Nov. 30 inclusive, and years since the opening of navigation:

Tons of 2,000 lb.	1877. Week.	1877. Year.	1876. Week.	1876. Year.
Anthracite	17,476	951,159	28,231	765,273
Bituminous	1,736	240,433	4,488	287,441
Total amount cleared	19,212	1,191,592	32,719	1,052,714
Of the above, there was cleared at tidewater ports, viz., New York, Albany, West Troy, and Waterford.	10,408	810,390	15,741	486,286
Cleared at internal ports	8,804	381,202	16,978	566,428

The production of Bituminous Coal for the week ending Dec. 1 was as follows:

Tons of 2,000 lb., except where otherwise designated.

	Week, Tons.	Year, Tons.
Cumberland Region, Md.		
Tons of 2,240 lb	9,781	1,448,892
Barclay Region, Pa.		
Barclay RR. tons of 2,240 lb	6,223	304,922
Broad Top Region, Pa.		
Huntingdon and Broad Top RR	3,078	128,576
*East Broad Top	1,303	47,362
Clearfield Region, Pa.		
*Snow Shoe	1,605	37,179
*Tyrone and Clearfield	30,674	1,206,729
Allegheny Region, Pa.		
*Pennsylvania RR	3,759	162,781
Pittsburg Region, Pa.		
*West Penn. RR.	4,667	165,275
*Southwest Penn. RR.	648	34,631
*Penn & Westmoreland gas coal, Pa. RR.	25,059	651,079
*Pennsylvania RR.	7,642	339,270

* For the week ending Nov 21.

The Production of Coke for the week ending Nov. 21

Tons of 2,000 lb.	Week.	Year.
West Penn. RR.	1,142	52,652
Southwest Penn. RR.	11,704	557,187
Penn & Westmoreland Region, Penn. RR.	1,251	57,973
Pittsburg, Penn. RR.	1,305	97,955
Total.	15,402	765,367

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Dec. 7, 1877.

Anthracite.

"Combination" is the sole topic of conversation, on every side, in the coal trade, and we are told by nearly every one connected with the large companies, and every one inspired by them, that a patent new combination will certainly be brought out before we next go to press. Those who are more conservative, and who are well informed, report the prospect as about seven to three in favor of combination. And yet we fail to see the ground for this general impression, except in the hopes of those who are eagerly clutching at any straw to save them from bankruptcy.

What is there in the situation to-day more favorable for the success of combination than there was a year ago, when the old one broke up? The managers of many of the companies now say that, without combination, there is inevitable bankruptcy before them—so they said then; and we are willing to concede that, with present prices and business, the prospects for bankruptcy are ominous. The sum total of the argument thus far used is, that the prices of coal are so low that the companies are unable to pay their fixed charges, and are consequently increasing day by day their already enormous debts. Since none of the companies is willing to reduce its production, or to hold for higher prices, and as the public will not pay more than it can help for coal, there seems no other way out of the difficulty than for the companies to unite, and oblige the public to pay such prices as will enable the companies to pay the enormous charges which now load down and oppress the trade.

We see no reason for changing our often expressed opinion that the conditions which would make a coal combination effective and permanent do not to-day exist in the trade, and yet we are quite ready to admit the possibility of the formation of a combination, whose object will be to reduce production, and advance prices. The managers of the several companies are agreed upon the desirability of increasing the price, but they have not yet come to any agreement upon the proportion which each company is to have in the total production, nor have they yet decided upon the nature of the guarantees to be given by each company to secure its good faith in the execution of the plan. That the matter has made some progress is evident, however, from the fact that none of the companies will sell coal for future delivery at present prices, though orders for immediate delivery are taken at the rates ruling during the past week or two. This is the only tangible indication of anything being seriously intended in the combination talk. Whatever be the result of the movement now on foot, and which, we are told, is to be brought to a focus about the 15th, we have not the slightest doubt about the ultimate result. Should combination be decided upon, it will be disastrous to the companies that might otherwise, with prudent and energetic management, succeed in recovering themselves financially. With restricted production and advanced prices the rates of wages must necessarily be advanced, and yet the workmen, having less and irregular work, will be even worse off than at present. The radius and consequent extent of our markets must be reduced as prices increase, and the growth of the anthracite trade will be checked. The effect of the higher prices will, no doubt, be to prolong the struggling existence of the smaller producers, and thus, without real benefit to any, maintain the very conditions which now oppress the trade; while the stronger companies will sink themselves by consenting to a restriction of business for the benefit of those less favorably situated geographically, financially, or managerially.

Mr. Gowen, in his last annual report to his stockholders, showed very conclusively, in a rapidly increased debt, the results of combination and restriction of business to his company, and he is now engaged on a report that will show in a large reduction of floating indebtedness and, very substantial profits, the benefits of free competition and large business. No one knows better than the chief owners and the President of the Reading that the only way in which a company in the condition of several of those in the coal trade can recover is by increasing, not restricting, the volume of its business. But *nous verrons ce que nous verrons.*

The policy announced in the following letter is of great importance to the coal interests of the Schuylkill region, and has been severely commented on by the representatives of the independent (!) operators. It is claimed with much force that these are placed by it, as it were, between the upper and nether millstones, for with any increase in prices, freights are advanced on the one hand, and wages on the other, so that the whole increase goes to the railroad and the men, and nothing to the individual operator, whose condition is none too hopeful now:

"The Philadelphia and Reading Coal and Iron Company, Philadelphia, December 3.—Henry Pleasants, Chief Engineer, Pottsville:—Dear Sir: I am told that the average price of coal for December will require a reduction of wages of about 31 or 32 per cent. below the basis, but you can pay our men at not less than 30 per cent. under the basis. Our railroad tolls for November were same as those prevailing in the summer, when we agreed not to go below 30 per cent. In September and October, when the minimum was 20 per cent., we were getting $1 50 for tolls and freights as against $1 25 for November; and you can inform the men that, during next year, for every twenty-five cents advance in tolls and freight, the minimum of wages will be advanced 10 per cent. In other words, when our freights and tolls are $1 50, the minimum will be 20 per cent. below the basis; when they are $1 75, the minimum will be 10 per cent. below the basis; when we get back to our old rate of $2, the basis will be the minimum. In this way the men can rest assured that hereafter high freights, which we want to get, will be high wages, which they want, and which I should like to see them get.

(Signed) "FRANKLIN B. GOWEN,
"President."

We are unable to make weekly comparisons of coal production, owing to the reports of some of the companies being for irregular periods. The production from January 1 to December 1, shows an increase of 1,693,059 tons as compared with the like period of 1876.

The Lehigh Valley Railroad reports the amount of its coal business for its fiscal year ending 30th November, as follows:

Anthracite received	Gross tons.
From Wyoming Region	1,031,778
" Hazleton "	2,121,358
" Upper Lehigh "	699
" Beaver Meadow "	577,452
" Mahanoy "	624,738
" Mauch Chunk "	6,099
Total transported in 1877	4,362,124
Total transported in 1876	3,951,513
Showing an increase the present year of	410,610

The Philadelphia & Reading Railroad Company reports its coal tonnage for its fiscal year ending 30th November as follows:

	Tons.
Coal passing over main line and Leb. V. Br.	4,808,269
Passing over laterals for shipment by Schuylkill Canal	815,543
West via N. Cent. R. W. & Cat. & Wpt. Br.	422,413
West and South from Pine Grove	106,320
Consumed on laterals	92,735
Lehigh & Wyoming coal	462,749
Total anthracite paying freight	6,708,029
" bituminous "	152,742
Coal for company's use anthracite	391,082
" " " bituminous	3,464
Total of all kinds for the year	7,255,317

Bituminous.

There is nothing of interest doing in Bituminous coals, the break in the Chesapeake and Ohio Canal has effectually closed that outlet from the Cumberland region for this year, and the shipments by rail, amounting for the week to only 10,000 tons, are confined only to filling existing orders.

The Clearfield is working along in a quiet way, having sent to market about 32,000 tons, which is a small increase over the previous week. The bituminous coal regions will be pleased to see the anthracite companies form a combination and advance prices, for this would quickly result in a greater demand for the soft coals. The movement to reduce the duties which is now being agitated would probably result in admitting coal either free or at a greatly reduced rate, and this would, no doubt, increase our importations from the Provinces, though the inferior quality of these coals, as compared with our own, would always restrict their introduction to narrow limits while prices here are low.

New York.

Wholesale Prices of Bituminous Coal.

Domestic Gas Coals.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside in New York.
Westmoreland and Penn. at Greenwich, Philadelphia	$4 70	$5 50
" " at S. Amboy.	5 00	5 50
Kanawha at Richmond	4 10	5 40
Red Bank Cannel Pa. at Philadelphia	8 00	8 50
Youghiogheny, Waverly Co., at Balt	4 50	5 65
Despard, West Va.	4 50	6 00
Murphy Run, West Va., at Baltimore	4 50	5 85
Fairmount, West Va., " "	4 40	5 70
Newburg Orrel, Md. " "	4 50	6 00
Cannelton Cannel, West Va.	....	10 00
" Splint " at Richmond.	6 00	7 00
" Gas Coal at Richmond	4 00	5 65
Peytona Cannel W. Va. at Richmond	....	10 00

Wholesale Prices of Anthracite Coal f. o. b. at the Tide Water Shipping Ports per ton of 2240lb.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
Lackawanna at Weehawken.	2 35	2 75	2 35	2 40	2 70	2 60
Pittston at Weehawken						
A. S. Swords	...	2 50	2 50	2 50	2 75	2 50
Pennsylvania Coal Company	....	2 45	2 45	2 45	2 75	2 45
‡Scranton at Hoboken	2 60	2 60	2 70	2 75	3 00	2 60
Kingston at Hoboken	....	....	2 40	2 45	2 75	2 50
Lehigh Coals.						
Sugar Loaf, at Hobok & Amb	3 50	....	2 85	2 85	3 00	2 60
Lehigh at Perth Amboy	3 50	....	2 85	2 85	3 00	2 60
Hazleton at Hoboken	3 50	....	2 85	2 85	3 00	2 60
Lehigh Coal Exchange	3 50	....	2 85	2 85	3 00	2 60
Mount Pleasant at Hoboken	3 50	....	2 85	2 85	3 00	2 60
Cross Creek at Port Johnston	...	....	2 85	2 85	3 00	2 60

‡ These quotations represent the average prices of the last auction sale.

Per ton.

Freight from Hoboken and Weehawken to New York.....40c.
" " Elizabethport & Port Johnston to N. Y.....40c.
" " South Amboy to New York.....40c.

Freight by the boats of the companies from Hoboken, Port Johnston, Weehawken, South Amboy and Perth Amboy to New York City and vicinity 40c.

Manufacturing and Steam Coals.

Cumberland at Georgetown and Alexandria, Va.....2 85@3 10 — 4 35@4 50
Cumberland, at Baltimore.....3 10@3 25 — 4 35@4 50
Clearfield f. o. b. Canton, Baltimore..3 25@.... — 4 35@4 50
Clearfield "Eureka" and "Franklin" at mines per ton 2,000 lb.....75c.; f.o.b.
Baltimore and Philadelphia per ton of 2,240 lb., $3.25; f.o.b. South Amboy, $4.25; alongside at New York, $4.50.

Foreign Gas Coals.

	Sterling.	Am. cur'cy
Newcastle, at Newcastle-on-Tyne	8/6@10/6	5 50@ 6 00
Liverpool House Orrel, at Liverpool	25/	13 00
Ince Hall Cannel "	35/6	18 00
" Gas Cannel "	25/6	10@10 50
Scotch Gas Cannel, at Glasgow, nominal,	25/	7 50
	Gold.	
Block House, at Cow Bay, N. S.	1 75	4 50
Caledonia, at Port Caledonia	1 50	4 25
Glace Bay, at Glace Bay	1 60	4 25
Lingan, at Lingan Bay	1 75	....
International mines at Sydney	1 75	4 50
Pictou, Vale mines, at Pictou	2 00	4 70

Retail Prices

Anthracite.

Per 2000 lbs.	Grate and Egg.	Stove.	Chestnut.
Pittston coal, delivered	$4 50	$4 50	$4 50
Lack. coal, delivered below 59th St.	4 00	4 00	4 00
*Wilkes-Barre, delivered	4 25	4 50	4 00
*Lehigh and Locust Mountain, del'd.	4 25	4 50	4 00

* These prices are for coal delivered below Canal Street The prices for coal delivered above that point are 50c. per ton more.

Bituminous.

Delivered, per ton of 2000 lb.

Liverpool House Orrel.	$18 00	American Orrel	$11 00
Liverpool House Cannel	18 00	Red Bank Cannel	7 00
American "	11 00	Cumberland	9 00
Cannelt'n Block, or splint	10 00		

Baltimore. Dec. 6, 1877.

Specially reported by Messrs. E. STABLER Jr., & Co.

Wholesale Prices per ton of 2,240 lb.

Hard White Ash.

AFLOAT BY CARGO.

Lump and Steamboat	$3 20	Stove	$3 45
Broken	3 25	Chestnut	3 10
Egg	3 35		

In cars in dealers' yards or on switch, 15c. per ton additional

Lykens Valley Red Ash.

AFLOAT BY CARGO.		BY RAIL IN CARS.	
Broken	$3 58	Broken	$3 80
Egg	3 58	Egg	3 80
Stove	3 58	Stove	3 80
Chestnut	3 28	Chestnut	3 40

From wharf or yard to the trade, 65c. per ton additional.

Boston. Dec 1, 1877.

The New York auction sales will have little or no effect on the Boston market through the winter, as our winter stock is now all here, with the exception of a few cargoes that will arrive from time to time.

We quote Boston wholesale prices as follows:

Anthracite, broken	$4 25@4 40	Caledonia	$4 25
do. egg	4 25@4 40	Cannel, English	16 00
do. stove	4 50	do. Buckeye	10 00
Franklin	4 75	Lingan	4 50
Cumberland	4 80@5 00	Pictou	4 75
Clearfield	4 55@4 75	Penn	6 40
Westmoreland	6 40	Youghiogheny	6 40

—*Commercial Bulletin.*

Chicago, Ill. Dec. 4, 1877.

Specially reported by Messrs. RENO & LITTLE.

Retail prices of coal delivered per ton of 2,000 lb.

Lackawanna Stove	$6 75	Erie and Brier Hill	$5 50
" Chestnut	6 75	Wilmington and Ill.	3 50@4 00
" Grate	6 75	Blossburgh	6 50
" Egg	6 50	Piedmont	7 50

Hamilton, Ont. Dec. 6, 1877.

Specially reported by H. BARNARD.

Retail Prices, Delivered per ton of 2,000 lb.

Scr. or Wilkes-B. Grate	$5 00	Lehigh Lump	$6 00
" " Egg	5 00	Brier Hill	5 50
" " Stove	5 25	Massillon	4 50
" " Nut	5 25	Smithing	5 50

Louisville, Ky. Dec. 3, 1877.

Specially reported by Messrs. BYRNES & SPEED.

Wholesale per bushel of 72 lb.

Pittsburg	8c.	Raymond City	7½c.
Ashland (Ky.)	7	Kentucky, on cars	8

Retail.

Pittsburg	$3 00	Anthracite, per ton	7 50
Raymond City	2 75	City Made Coke per bush	7c.
Ashland, Ky	2 50	Soft Coke per bushel	7c.
Pittsburg nut	2 50		

Milwaukee, Wis. Nov. 30, 1877.

Specially reported by Messrs. R. P. ELMORE & Co.

Retail price per ton of 2,000 lb.

Anthracite, egg, chestnut, and stove	$6 50		
Lehigh lump	$7 00	Connellsville coke on RR. track	$7 25
Briar Hill	$5 25	Straitsville	4 80

Montreal. Dec. 5, 1877.

Specially reported by Messrs. ROBERT C. ADAMS & Co.

Wholesale per 2,240 lb.

Scotch Steam	$4 00	Cape Breton Steam	$3 25
Pictou	3 75	Newcastle Smith's	5 00

Anthracite at retail, per 2,000 lb. delivered.

New Orleans, La. Dec. 1, 1877.

Specially reported by Messrs. C. A. MILTENBERGER & Co.

Coal on hand December 1: Pittsburg coal, 44 boats and 1 barge: St. Bernard coal, 3 boats. Consumption during November: 33 boats, 4 barges and 1 French Creek. Arrivals during November: 17 boats, 4 barges and 1 French Creek.

The coal market has been considerably demoralized during the past week owing to the large stock now en route for this point.

PITTSBURG COAL.

At wholesale (by boat load).....35c. per bbl. of 180 lb.
To steamboats.....5cc. " "
" manufactories.....50c. " "
" families.....75c. " "
In hhds. (for shipment).....$7 00 per hhd. from 5 bbls.

ANTHRACITE COAL.

Per ton of 2,000 lb.

At wholesale.....$7 00 to 8 00
" retail.....11 00 to 12 00

ST. BERNARD (KY.) COAL.

To steamboats.....45c. " "
" families.....65c " "

Pittston, Pa. Dec. 3, 1877.

Pennsylvania Coal Company's Coal in yard, ton of 2000 lb.

Retail.

Lump, Egg and Stove	$2 25
Chestnut	2 00
Pea	1 00
Delivered, fifty cents per ton additional	

Richmond, Va. Dec. 6, 1877.

Specially reported by S. H. HAWES, Dealer in Coal.

Per ton of 2,240 lb., f. o. b.

Kanawha Cannel	$9 00	New River Bituminous	$3 70
Coalburg Splint	5 70	Clover Hill Coal	3 00
Lewiston "	5 70	Norwood Gas & Steam Coal	2 70
Kanawha Gas Coal	4 90		

Sandusky, O. Dec. 3, 1877.

Specially reported by C. E. BLACK, Agt. Con. Coal & Mg. Co

We quote coal on cars at Sandusky, as follows:

Per ton of 2,000 lbs.

Anthracite.

	Grate.	Egg.	Stove.	Chestnut
Lehigh	$6 50	$6 50	$6 50	$6 50
Wilkes-Barre	5 75	5 75	5 75	5 75
Lackawanna	5 75	5 75	5 75	5 75

Bituminous.

Massillon	$3 00	Straitsville	$2 70
Del Carbo	2 75	Shawnee	2 70
Hocking Valley	2 70	Blossburg	4 75

Prices retailed delivered 50c.@75c. above car prices.

San Francisco, Cal.

From the *Commercial Herald* of Nov. 29, 1877.

COAL—Imports from January 1 to Oct. 30:

	Tons.		Tons.
Anthracite	18,173	Vancouver Island	84,094
Australian	61,246	Rocky Mountain	123
Coos Bay	25,504	Saghalien	40
Cumberland	10,129	Seattle	88,167
English	75,645	Bellingham Bay	8,600
Chili	8,145	Ione, Cal.	2,718
Mt. Diablo,	68,698	Carbondale, Cal.	177

All the Australian in market (spot cargoes) have been disposed of during the past few days. One cargo sold at Portland, Or., at $5.75 on 60 days' time, while three cargoes of Wallsend sold here within the range of $7@7.50@7.75, according to size of cargo, etc. The Centaur's cargo of 2,216 tons Wallsend from Sydney sold at or about $6.75, the lowest rate yet touched. There is an effort making to increase the supplies from Coos Bay, even at the low rates ruling. The general market is very sluggish, and prices of anthracite, as well as all other kinds, both low and nominal. The arrivals include the J. B. Bell and Osmyn, from Seattle, with 1,800 tons, and the Henry Buck, from Nanaimo, with 1,060 tons.

St. Louis, Mo. Dec. 5, 1877.

Reported by JAS. J. SYLVESTER, Secretary of the Anthracite Coal Association.

Retail prices, delivered. Ton of 2,000 lb.

ANTHRACITE.

	per ton.		per ton.
Lackawanna	$8 00@8 50	Schuykill	8 00@ 8 50
Wilkes-Barre	8 00@8 50	Lehigh	9 00@ 9 50

BITUMINOUS.

Blossburg	9 00	Big Muddy	3 00
Pittsburg	4 50	Illinois Coals	2 50@3 00
Indiana Block	4 00	Connellsville Coke	6 50

Freights

Per ton of 2240 lb.

Representing the latest actual charters to Dec. 6, 1877.

PORTS.	From Philadelphia.	From Baltimore	From Georgetown.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
Augusta, Me.		....	....	2 25
Albany	....	....	....	....
Alexandria, Va	1 28	....	....	....
Brooklyn, N.Y.	....	....	....	....
Bangor, Me.	....	....	....	1 60
Bath, Me.	....	1 75	....	1 50
Baltimore	55@80	....	....	....
Boston, Mass.	165@175	1 75	....	1 50
Bridgeport, Ct.	....	1 55	....	70
Bristol, R. I.	....	....	....	90
Beverly, Mass.	....	..	....	1 50
Cambridge, Mass.	....	..	....	1 50
Charleston, S.C.	....	....	....	....
Danversport, Mass.	....	....	....	....
East Cambridge, Mass	....	....	....	....
Fredericksburg, Va.	....	....	....	....
Fall River	....	1 55	....	90
Gloucester	....	....	....	....
Georgetown, D.C	....	..	....	.
Hartford, Conn.	....	....	....	....
Hoboken	....	....	....	40
Hudson, N.Y.	....	....	....	....
Jersey City	....	....	....	40
Lynn, Mass	....	....	....	....
Medford, Mass.	....	..	....	....
Middletown	....	....	....	90
Milton Mass	....	....	....	....
Nantucket, Mass	....	....	....	90
New Bedford	130@135	....	....	90
Newburyport	....	2 00	....	1 75
New Haven	....	1 55	...	70
New London	....	1 55	....	70
Newport	....	.	....	90
New York	75	1 40	....	40
Newark, N J	....	....	....	....
Norfolk, Va.	75	....	..	....
Norwich	1 32½	....	.	90
Pawtucket	1 40	..	....	1 00
Philadelphia	....	....	....	....
Portland	1 50	1 75	....	1 50
Portsmouth, N. H.	1 60	2 00	....	1 65
Providence	125@130	1 55	..	90
Rockland, Mass.	....	....	....	....
Rockport	..	....	....	....
Richmond, Va.	1 00	....	....	....
Saco	....	....	...	1 75
Salem, Mass.	1 65	1 80	....	1 50
Saybrook, Mass.	....	....	..	....
Savannah, Ga.	....	....	....	....
Somerset, Mass	....	....	....	90
Troy	....	....	....	....
Thomastown, Me.	....	....	....	....
Washington	75@125	....	....	..
Wilmington, N.C.	....	....	..	..
West Farms, N.Y.	....	....	....	....

* And discharging and towing. † And discharging. ‡ And towing. § 3c per bridge extra.

Freights on Bituminous Coals from the Mines to Tide Water Shipping Ports.

For the above rates we refer to our issue of Nov. 17.

For freights on *Lehigh and Wyoming Coal* we refer to our issue of Sept. 15.

For freights on *Schuylkill Coals* we refer to our issue of Nov. 17.

For rates of freights on the Chesapeake & Ohio Railroad we refer to our issue of Dec. 1.

Towing.

For the above see issue of December 1.

IRON MARKET REVIEW.

New York.

FRIDAY EVENING, Dec. 7, 1877.

American Pig.—The market for iron has been more quiet than for months. This, however, is the season of the year when a dull trade is usually expected. We note a sale of 250 tons of Lehigh No. 2 foundry iron on private terms. Prices are weaker. This and the dullness are accounted for by the closing of inland navigation, and the accumulation of stocks beginning once more. Large lots could probably be secured for cash at as low a figure as at any previous time. We quote, nominally as follows: No. 1 foundry, $18@$20; No. 2 foundry, $17@18, and forge, $16@17.

Scotch Pig.—The business in this article is confined to retail lots, and prices are but nominal. Two hundred tons, a late arrival, have gone into store. We quote Coltness at $26; Eglinton, $24, and Glengarnock, $24.50.

Rails.—We are reported sales for the West of about 10,000 tons of steel rails, and for the East 4,000 tons. We also note sales of about 1,500 tons for export. We continue to quote steel rails at $40@$43 at mills, and iron rails at $33@$37.

Old Rails.—There is nothing doing in these. We quote nominally at $18@$18.50.

Wrought Scrap.—In the absence of business we quote this at $22, nominal.

Baltimore, Md. Dec. 3, 1877

Specially reported by Messrs. R. C. HOFFMAN & Co.

The iron market remains unchanged. Demand light and trade dull. We quote :

Baltimore Charcoal	$29@30	Mottled and White	$15@16 00
Virginia Charcoal	28@30	CharcoalC.B.Blooms	50@55 00
Anthracite No. 1	19@20	" " Billetts.	55@60 00
" 2	18@19	Refined Blooms	45@50 00
Anthracite No. 3	17@18		

Chattanooga, Tenn., Dec. 4, 1877.

The market here remains unchanged. No improvement in demand or price. The reports from all the leading brokers and furnaces West and East indicate the markets as " dead," with no encouragement from general trade for any reaction till next spring.

Specially reported by J. F. JAMES, dealer in pig iron, ores, etc.

Tenn., Ala. and Ga. Charcoal, No. 1 Foundry	$18 00@19 00		
Tenn., Ala. and Ga. Charcoal, No. 2 Foundry	17 00@18 00		
Tenn., Ala. and Ga. Charcoal, Gray Forge	15 00@16 00		
Tenn., Ala. and Ga. Coke, No. 1 Foundry	19 00@20 00		
Tenn., Ala. and Ga. Coke, No. 2 Foundry	17 00@18 00		
Tenn., Ala. and Ga. Coke, Gray Forge	15 00@16 00		
Charcoal or Coke, white and mottled	14 00@15 00		
Tenn., Ala. and Ga. Cold Blast (car wheel)	22 00@28 00		
Old rails	18 00@19 00	Wrought scrap,	
Old car wheels	16 00@17 00	No. 2	12 00
Wrought scrap, No. 1	17 00	Cast scrap	10 00
		Muck bar	32 00@33 00

Iron Ores.

Red Hematite (about 55 per cent. metallic iron) f. o. c. at mines	1 25
Brown Hematite (about 55 per cent. metallic iron)	1 75

Cleveland, O. Nov. 30, 1877.

Specially reported by Messrs. C. E. BINGHAM & Co.

Per gross ton, on four months' time. Subject to change in market. Discount for cash 4 per cent.

FOUNDRY IRON.

No. 1, L. S. Charcoal	$25 00	Am. S., No. 1, Ch Val.	$24 00
No. 2, " " "	25 00	" " B. 1, " "	23 00
No. 1, Anthracite	23 00	" " No. 2, " "	22 00
No. 2, "	21 00	No. 1, Massillon	24 00
No. 1, Bituminous	23 00	B—1, "	23 00
No. 2, "	21 00	No. 2, "	22 00

CAR WHEEL AND MALLEABLE IRON.

No. 3 L. S. Charcoal	26 00	No. 5 & 6, L. S. Charcoal	$27 00
No. 4, " " "	26 00		

BESSEMER IRON.

Nos. 1 & 2, L. S. Char	$25 00

FORGE IRON.

No. 1, Gray	$20 00	White and Mottled	$19 00

Cincinnati, O. Dec. 4. 1877.

Specially reported by Messrs. TRABER & AUBERY, commission merchants for the sale of pig iron, blooms, ore, etc.

CHARCOAL.

Hanging Rock No. 1 Foundry and B 1	$23 00@23 50	4 mos
" No. 2 "	22 00@	4 mos
" Soft Silver Gray	21 00@22 00	4 mos
" Mill	18 00@20 00	4 mos
Tennessee, No. 1 Foundry	22 00@	4 mos
" " 2 "	21 00@	4 mos
" Mill,	18 00@19 00	4 mos

STONE COAL.

Ohio, No. 1 Foundry	20 00@20 50	4 mos
" " 2 "	19 00@19 50	4 mos
" " 3 "	18 00@18 50	4 mos
" Mill	18 00@18 50	4 mos

COKE.

Ohio & W. Va. No. 1 Foundry	22 00@	4 mos
" " " 2 "	21 00@	4 mos
" " Mill	18 00@19 00	4 mos

CAR-WHEEL.

Hanging Rock, C. B.	Hecla, Vesuvius, Jefferson, Etna.	38 00@	4 mos
Maryland, "	Amherst & Cedar Pt.	37 00@	4 mos
Missouri, "	Maramec	31 00@	4 mos
Alabama, "	Woodstock	32 00@	4 mos

BLOOMS.

Charcoal	45 00@50 00—cash.

SCRAP IRON.

Cast	40c.@ 45c.— "
Wrought	62½c.@ 1 00— "

Columbus, O. Dec. 4, 1877.

Specially reported by KING, GILBERT & WARNER, dealers in Pig Iron and Ores.

The pig iron market is quiet, with little prospect of improvement this month, as consumers are careful not to buy ahead till the year's business is settled up. The usual time, four months, allowed on quotations.

FOUNDRY IRONS.

No. 1 Hanging Rock Charcoal	$24 to 25
No. 2 " " "	22 to 23
No. 1 Hocking Valley soft and strong from pure limestone ores	22 to 23
No. 2 Hocking Valley soft and strong from pure limestone ores	21 to 22
No. 3 Hocking Valley soft and strong from pure limestone ores	20 to 21
No. 1 American Scotch	21 to 22
No. 2 " "	19 to 20
Silver Gray	18 to 19

MILL IRONS.

Gray neutral	19 to 19 50
Mottled and white neutral	18 to 18 50
Gray cold short	18 to 18 50
Mottled and white cold short	17 to 17 50

Louisville, Ky. Dec. 4, 1877.

Specially reported by Messrs. GEORGE H. HULL & Co.

Trade continues brisk, but demand mostly for use between this and New Year's. Prices of the past few months remain unchanged, with but little prospect of any early variations. The usual time, four months, allowed on quotations below :

FOUNDRY IRONS.

No. 1 Hanging Rock, Charcoal	$23 00@24 00
No. 2 " "	20 00@21 00
No. 1 Southern Charcoal	20 00@21 00
No. 2 " "	19 00@20 00
No. 1 Hanging Rock, Stonecoal and Coke	20 00@22 00
No. 2 " " " "	19 00@20 00
No. 1Southern Stonecoal and Coke	19 00@20 00
No. 2 " " "	18 00@19 00
" American Scotch"	20 00@22 00
Silver Gray	18 00@19 00

MILL IRONS.

No. 1 Charcoal, Cold-short and Neutral	18 50@19 50
No. 1 Stonecoal and Coke, Cold-short and Neutral	18 00@18 50
No. 2 " " " " "	17 50@18 00
No. 1 Missouri and Indiana Red-short	21 00@22 00
White and Mottled, Cold-short and Neutral	20 00@22 00

CAR-WHEEL AND MALLEABLE IRON.

Hanging Rock. and Cold Blast	34 00@38 00
Alabama and Georgia "	28 00@33 00
Kentucky Cold-blast	25 00@33 00

Milwaukee, Wis. Nov. 30, 1877.

Specially reported by Messrs. R. P. ELMORE & Co.

Wholesale Price.

Charcoal Iron.

No. 1 Lake Superior per gross ton	$23 00—4 mos.
No. 2 " " "	22 00—4 mos.

Anthracite Iron.

No. 1 anthracite per gross ton	$24 00—4 mos.
No. 2 " " "	23 00—4 mos.

Stone Coal & Coke.

Wholesale Price.

Warner's Am. Sc'th (Bk. Band) per ton	$25 00@ —4 mos.
Soft Silvery per ton	22 00@23 00—4 mos.
Ohio stone coal	22 00@23 00—4 mos.

Car Wheel.

Lake Superior ores per ton	$25 00@27 00—4 mos

Pittsburgh, Pa. Dec. 4, 1877.

Specially reported by A. H. CHILDS.

The market is quiet and unchanged. The mills report a falling off in their orders, and there is but little disposition to purchase ahead of immediate wants. The general belief, however, is that a fair business will be done during the winter, and that present prices will be maintained.

	4 mos.		4 mos.
No. 1 F'dry	$21 00@22 00	Mottled&White	$16 50@18 00
" 2 "	20 00@21 00	Hot blast C'coal	21 00@25 00
Gray Forge	18 00@20 50	Cold " Western	38 00@40 00

Philadelphia, Pa.

[Weekly Report of the Philadelphia Iron Market, furnished for THE ENGINEERING AND MINING JOURNAL, by JUSTICE COX, Jr., & Co., Iron Merchants, 323 Walnut Street, Phiadelpiia, Week ending Dec. 1, 1877.]

PIG IRON.—The month comes in with a dull market for pig, yet iron is quoted higher and firmer than at the beginning of last month. The small lots pressing on the market have been about taken up, leaving only the stocks of the firmer companies to draw from, hence a firm market, as all iron producers affirm. They are selling the low grade of iron for less than cost of production. There have been quite a number of small sales, as is always at this season, for shipment, but the general market can be quoted dull. We report sales of about 3,000 tons, and quote No. 1 at $18.50@20; No. 2, $17@18; Gay forge, $16.50@18, all at Philadelphia.

MANUFACTURED IRON.—The demand for bars is rather on the improvement. No large contracts, however, are coming on the market, but the every day trade is improving. The mills that have been underselling the market are either getting into financial trouble, or asking full price for their iron, hence the improvement in bars. As soon as consumers find that bottom has been reached, just so soon may we expect a revival in trade. The large inquiries for plates last week have not, as yet, resulted in business; but it is hoped before this goes to press the orders will be placed at several thousand tons.

SKELP is exceedingly dull just, now as generally at this season of the year. We quote bars 2c. to 2 1-10c, per lb.; plate and tank 2 2-10c. to 6c. per lb.; skelp 2 1-10c. to 2¼c. per lb.

RAILS.—We do not hear of anything new in steel rails. Most mills running have about all they can do for the balance of the year. In iron rails some inquiry is reported that may result in some large sales, say 3,000 or 4,000 tons, but as yet nothing definite is known. We quote steel at $40@43, and iron at $33@35.

OLD RAILS.—The demand for old rails continues brisk, with a very short supply. Prices have advanced very materially, in some cases as high as $33 is asked, but, of course, this does not result in business. There have been several sales at $20, and one or two at $20.50. We quote, $20@21.

SCRAP continues dull ; wrought is in plentiful supply, and low prices would be acceptable for round lots; cast scrap is hard to move at any price, this will continue as long as pig iron continues so low. We quote wrought, $20 to $24; cast, $12 to $16.

OLD WHEELS continue to be pushed on the market at almost any price. A sale is reported at less than $16 for a large lot, but small lots bring $17 to $18.40.

MUCK BARS are quoted in absence of business at $34 to $36.

San Francisco, Cal.

From the *Commercial Herald* of Nov. 29, 1877.

From the San Francisco *Commercial Herald* of November 29, there appears to be very little demand for Pig Iron, Tin Plate, or in fact for any other kind or description of goods in this important branch of trade. Prices for the most part rule low and nominal.

Richmond, Va. Dec. 4, 1877.

Specially reported by ASA SNYDER, Esq.

The market for pig iron is feeling distinctly the paralysis of the closing month of the year. While figures are unchanged there is quite a buoyant expectation of a firm market for the opening year.

Virginia Cold Blast Charcoal Pig Iron, cold short	$20 to $26
" " " " " neutral	28 to 31
" Warm " " " "	20 to 25
" Anthracite 1 X	20 to 22
" " 2 X	19 to 21
" " 2	18 to 19
" " Coke West Va. 1 X	22 to 23
X 2	21 to 22

St. Louis, Mo. Dec. 4, 1877.

Specially reported by Messrs. SPOONER & COLLINS, Commission Agents for all kinds of Iron.

Pig iron is still in good demand, and while prices are very low there seems to be a little margin left for some of our furnaces, and they propose running out. Cheap qualities of pig iron are very scarce.

COLD BLAST CHARCOAL—ALL NUMBERS.

Hanging Rock	25@38	Assorted Bar Iron	$2, rates.
Tennessee	26@30	No. 1 Wrought Scrap	80c. cwt.
Kentucky	26@30	Heavy cast "	65 "
Missouri	26@30	Light "	55 "
Georgia	26@30	Old rails	19 00 to 20 00
Alabama	26@30	Old car wheels	17 00 to 18 00

	No. 1.	No. 2.	Mill.	White and Mottl'd.
Missouri stone coal	$22 00	$21 00	$20 00	19 00
" charcoal	22 00	21 00	20 00	20 00
Tennessee charcoal	22 50	21 00	20 00	19 00
Tenn. coke very soft and strong	23 00	21 00	20 00	18 50
Hanging Rock charcoal	25 00	24 00	23 00	.....
" " cold short	24 00	23 00	.....	.....
	Ex No.1	No. 1.	B No. 1.	No. 2.
Alice Hanging Rock coke	$25 00	$24 50	$24 00	$22 50
Quinnimount, W.Va., coke	23 50	23 00	22 00	21 00

METALS.

NEW YORK, FRIDAY EVENING, Dec. 7, 1877.

The present week has been one of the quietest of the year, not an article showing business worthy of note.

Gold Coin.—During the week under review the price of gold has ranged from 102⅞ to 102½, closing at 102⅝.

Bullion.—Silver continued rather nominal abroad, and dull here at about 117 during the early part of the week, with an advance to 117¼ on Wednesday, but this fractional advance was lost to-day, and the market is weak at 116¾. The demand for India has almost ceased, and unless our legislation affects the price favorably, it is quite certain to decline. The London quotation is 54d., while San Francisco quotes at ten per cent. discount.

Daily Range of Silver in London and New York per oz

Date.	London.	New York.	Date.	London.	New York.
	Pence	Cents		Pence	Cents
Dec. 1	54	117	Dec 5	543-16	117¾
" 3	54	117	" 6	54⅛	117
" 4	54⅛	117	" 7	54	116¾

The San Francisco Mint Coinage for the month of November amounted to $4,200,000.

The Philadelphia Mint Coinage for November was all in silver, as follows :

Denomination.	*No. of Pieces.*	*Value.*
Trade dollars	400,000	$400,000
Half dollars	834,000	417,000
Quarter dollars	722,000	180,600
Dimes	140,000	14,000
Total,	2,096,400	$1,011,600

BULLION SHIPMENTS.

We give below a statement showing the amount of the latest bullion shipments in addition to that announced in our issue of December 1:

November	California	Nevada	*a* $2,300,000
"	Con. Virginia	"	*a* 800,000
Nov. 19	Northern Belle	"	" 3,800
" 22	Martin White	"	" 15,721
" 22	Tybo Con	"	" 54,555
" 20	Manhattan	"	" 9,500
" 23	Grand Prize	"	" 17,100

a From Nov. 1 to Nov. 30, inclusive.

Copper.—We are reported sales of about 100,000 lb. at 17 5/16c. to 17¾c. The market closes strong at 17¾c., with something of a speculative spirit in existence.

Tin.—Straits is quoted to-day in London at £66.15. On the 4th inst the Penang quotation was $19. Singapore $16.80 per picul, with exchange at 4s. 0⅛d. The shipments of Straits tin to America, for November, amounted to 275 tons. Nothing has been done in this market during the week under review. The arrival of 2,764 piculs of Straits tin per *Glenartney*, has had a slightly weakening tendency on the spot price, which cannot be quoted higher than 16⅜c, and to arrive,

COAL TRANSPORTATION AND GENERAL MINING STOCKS.

Name and Location of Company.		Feet on Vein.	Capital Stock	Shares. No.	Shares. Par Val.	Assessments. Total levied to date.	Assessments. Date and amount per share of last. Mo.	Yr.	Amt.	Dividends. Total paid to date.	Last Dividend. Mo.	Yr.	Amt.	Rate per Ann.	Highest and Lowest Quotations per Share in Currency. Dec. 1. H.	L.	Dec. 3. H.	L.	Dec. 4. H.	L.	Dec. 5. H.	L.	Dec. 6. H.	L.	Dec. 7. H.	L.	Sales.
Coal Stocks.			$			$				$				Per cent.													
Consol. Coal	Md.	....	10,250,000	102,500	$100	*	.....	.....	.....	....	Jan.	1877	2¾	10	..	..	..	..	..	..	..	..	..	..	..	25½	....
Del. & H. Canal	Pa.	....	20,000,000	200,000	100	*	.....	.....	.....	38,821,104	Aug.	1876	4	9	47	45	48½	45⅛	47⅜	46½	48¼	47⅜	49⅛	48¼	49½	46⅜	16,525
Del., Lac. & W. RR.	Pa.	...	26,200,000	524,000	50	*	.....	.....	.....	....	July	1876	2¾	5	50¼	47⅛	50	47¾	49⅜	48⅜	49⅜	48⅜	50⅝	49¼	51⅜	50¼	184,330
Lehigh C. & Nav.	Pa.	....	10,448,550	208,971	50	*	.....	.....	.....	.. ..	Nov.	1876	1¾	5⅛	18⅜	18¼	19	18¾	18¾	18¾	18⅞	18½	18⅝	18⅞	18⅞	18⅝	4,953
Lehigh Valley RR.	Pa.	....	27,042,900	540,858	50	*	.....	.....	.....	....	Oct.	1877	1	5	40¼	40	39¾	39¾	39¾	39½	40	39¾	40¼	40	40¼	40	1,951
Maryland Coal	Md.	....	4,400,000	44,000	100	*	.....	.....	.....	....	Jan.	1876	1½	1½	..	..	..	..	..	..	..	..	..	..	..	..	....
N. J. Central RR.	Pa.	....	20,600,000	206,000	100	*	.....	.....	.....	....	Apr.	1876	2½	2½	..	..	13⅛	13½	..	..	..	..	13⅞	13¾	14	13⅞	219
Penna. Coal	Pa.	....	5,000,000	100,000	50	*	.....	.....	.....	....	Aug.	1877	3	12	..	..	..	..	..	..	..	..	..	..	..	145	19
Pennsylvania RR.	Pa.	....	68,870,200	1,377,404	50	*	.....	.....	.....	....	Nov.	1877	1½	8	31⅞	31¼	32⅜	31⅜	32⅜	32⅛	32	31⅜	32	31¾	31⅞	31¾	62,886
Phil. & Read. RR.	Pa.	....	34,278,175	685,563	50	*	.....	.....	.....	43,012,497	Jan.	1876	*2½	10	16½	16¼	16¼	16⅜	16⅜	16½	10¼	16¼	16⅞	16⅜	16⅜	16⅜	13,388
General Mining Stocks																											
Alpha Cons. G. S.	Nev.	300	3,000,000	30,00	100	210,000	Aug.	1877	$1 00	....	.....	.....	.....	..	13	..	13¾	..	14¾	..	14¼	..	15	..	..	..	600
American	Colo.	....	1,000,000	100,000	10	*	.....	.....	.....	10,000	Dec.	1877	0 10	12	4⅞	4¾	5	4⅞	5⅛	5	5⅛	5	5¼	5	5	..	5,420
Am. Flag, G.	Colo.	5,300	600,000	60,000	10	*	.....	.....	.....	....	.....	.....	.....	..	..	..	11c	..	11c	..	11c	..	..	..	11c	..	4,000
Belcher, G. S.	Nev.	1,040	10,400,000	104,000	100	1,072,400	Sept	1877	1 00	15,397,200	Apr.	1876	$1 00	12	7¼	..	7¼	..	7⅛	..	7⅛	..	..	..	8	..	600
Bertha & Edith G.	Vir.	645 acs.	3,300,000	350,000	10	*	.....	.....	.....	....	.....	.....	.....	..	..	..	7c	6c	7c	..	7c	5c	6c	1c	4c	1c	20,600
Best and Belcher, G. S.	Nev.	545	10,080,000	100,800	100	337,792	Aug.	1877	1 00	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Bobtail, G.	Colo.	2,500	1 136,630	227,326	5	*	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Bobtail Tunnel, G.	Colo.	....	100,000	20,000	5	6,000	July	1873	0 30	20,000	Dec.	1876	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Bullion, G. S.	Nev.	943½	10,000,000	100,000	100	2,702,000	Oct.	1877	1 50	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Caledonia, G. S.	Nev.	2,188	10,000,000	100,000	100	1,435,000	Oct.	1877	75	....	.....	.....	.....	..	4¾	4½	5	..	5½	..	..	..	5¾	..	5½	..	1,000
California, G. S.	Nev.	600	54,000,000	540,000	100	....	.....	.....	.....	20,520,000	Nov.	1877	2 00	24	..	..	..	..	..	..	..	..	..	..	..	..	....
Cholliar Potosi, G. S.	Nev.	1,400	2,800,000	28,000	100	1,506,000	Oct.	1877	3 00	3,080,000	Feb.	1872	1 00	12	..	..	..	..	..	..	..	..	..	..	..	..	....
Cleveland, G.	Colo.	3,715	250,000	25,000	10	*	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Cons. Hercules & Roe.	Colo.	16,500	1,000,000	100,000	10	*	.....	.....	.....	120,000	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Cons. Imperial, G. S.	Nev.	468	50,000,000	500,000	100	575,000	Oct.	1877	0 20	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Con. N. Slope & E. C. T.	Colo.	15,000	500,000	10,000	50	*	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Cons. Virginia, G. S.	Nev.	710	54,000,000	540,000	100	474,600	June	1873	3 00	34,560,000	Nov.	1877	2 00	24	..	..	..	..	..	..	..	..	..	..	26½	..	5
Confidence, G. S.	Nev.	130	2,496,000	24,960	100	243,840	Mar.	1873	1 00	78,000	May.	1865	8 ⅓	8⅓	..	..	..	..	..	..	..	..	..	..	7½	..	100
Crown Point, G. S.	Nev.	600	10,000,000	100,000	100	1,573,370	Sept.	1877	1 00	11,588,000	Jan.	1875	2 00	24	..	..	..	..	7	..	7½	..	7½	..	..	..	400
Douglas	Colo.	21,000	1,000,000	10,000	100	*	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Eureka Cons. G. S. L.	Nev.	..	5,000,000	50,000	100	100,000	May	1876	1 00	1,300,000	Oct.	1877	3 00	24	37¼	..	36½	..	..	..	35¾	..	36¼	..	..	..	500
Eureka G. Mg. G.	Cal'f	1,680	2,000,000	20,000	100	....	.....	.....	.....	2,134,000	Aug.	1877	2 00	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Exchequer, G. S.	Nev.	400	10,000,000	100,000	100	280,000	Sept.	1876	1 00	....	.....	.....	.....	..	4½	..	4¾	..	..	..	..	..	..	..	..	..	300
Gould and Curry, G. S.	Nev.	612	10,800,000	108,000	100	2,450,000	Aug.	1877	1 00	3,826,800	Oct.	1870	10 00	..	10½	..	10¾	..	12¼	..	11	..	..	..	11¼	..	800
Granville Gold	N. C.	9,000	1,000,000	100,000	10	*	.....	.....	0 50	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Hale & Norcross, G. S.	Nev.	400	11,200,000	112,000	100	2,634,000	Oct.	1877	1 00	1,598,000	Apr.	1871	5 00	12	11	..	13⅜	..	12½	..	12	..	13	..	12¾	..	600
Henry Tunnel	Nev.	3,000	2,000,000	80,000	25	*	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Hukill, G. S.	Colo.	3,288	1,000,000	100,000	10	*	.....	.....	.....	110,000	Dec.	1877	0 10	12	..	..	4½	..	4¾	..	..	..	..	..	..	..	200
Julia Cons., G. S.	Nev.	3,000	11,000,000	110,000	100	440,000	Aug.	1877	1 00	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Justice, G. S.	Nev.	2,100	10,500,000	105,000	100	2,027,500	Oct.	1877	2 00	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Kentuck, G. S.	Nev.	95	3,000,000	30,000	100	270,000	Dec.	1874	1 00	1,252,000	Mar.	1870	5 00	..	..	..	5½	..	6	..	..	..	5½	..	6½	..	600
Kossuth, G. S.	Nev.	2,700	5,400,000	108,000	50	421,200	Aug.	1877	0 15	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Lacrosse	Colo.	3,900	1,000,000	100,000	10	*	.....	.....	.....	....	.....	.....	.....	..	..	..	22c	..	22c	21c	24c	23c	25c	23c	23c	..	5,700
Leopard, L. G. S.	Nev.	1,500	5,000,000	50,000	100	100,000	July.	1877	50	162,500	Dec.	1876	0 50	..	1½	..	..	..	..	..	..	..	..	..	..	..	100
Lucerne Mining	Colo.	4,200	5,000,000	500,000	10	*	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Mariposa, preferred	Cal.	44,387	5,000,000	50,000	100	1,425,000	June	1877	1 00	....	.....	.....	.....	..	5	3⅜	..	..	..	..	4	..	..	..	..	..	1,200
" common	"	acres.	10,000,000	100,000	100	1,425,000	June	1877	1 00	....	.....	.....	.....	..	3¼	2⅜	..	..	..	..	2½	..	..	..	..	..	1,800
Memphis	Colo.	6,000	300,000	60,000	5	*	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Merrimac, S.	Mass.	1,500	500,000	50,000	10	*	.....	.....	.....	100,000	Dec.	1877	0 10	12	..	..	..	..	5¼	..	5½	5¾	5⅝	..	5½	..	900
Mexican, G. S.	Nev.	600	10,080,000	100,800	100	181,440	Aug.	1877	0 30	....	.....	.....	.....	..	..	..	16¾	..	17½	..	16¾	..	10¾	..	16⅜	..	900
Moose	Colo.	39,000	2,000,000	200,000	10	*	.....	.....	.....	125,600	Dec.	1877	0 25	10	7⅞	7⅝	7⅞	7⅝	7¾	7⅜	7¾	7⅝	7¾	7⅝	7¾	7½	16,100
N. Y. & Colo., G.	Colo.	....	1,000,000	50 000	20	*	.....	.....	.....	20.000	Mar.	1877	0 20	..	2¼	..	2¼	..	2⅛	..	2⅜	1¾	2¼	2⅛	2¼	2⅛	1,960
Northern Belle, S.	Nev.	1,600	5,000,000	50,000	100	....	.....	.....	.....	1,400,000	Oct.	1877	1 00	..	..	..	..	..	13½	..	..	..	..	..	..	..	25
Ontario	Utah	3,000	10,000,000	100,000	100	....	.....	.....	.....	850,000	Dec.	1877	1 50	6	25¼	25½	28	27	28	27¾	28¼	..	..	..	..	..	3,150
Ophir, G. S.	Nev.	675	10,080,000	100,800	100	2,934,400	May.	1875	2 00	1,394,400	Mar.	1864	4 00	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Original Comstock, G. S.	Nev.	....	10,000,000	10,000	100	....	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Overman, G. S.	Nev.	1,200	3,840,000	38,400	100	2,567,880	Nov.	1877	3 00	....	.....	.....	.....	..	..	..	25	24¾	26¾	..	24¼	..	30⅞	..	29¾	..	600
Pleasant View, G.	Colo	1,200	200,000	20,000	10	*	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Quicksil. preferred	Cal.	8,500	4,291,300			*	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	33½	..	..	..	..	..	..	..	300
" common	"	acres.	5,708,700	100,000	100	....	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	16	..	..	..	..	..	200
Raymond and Ely, G. S.	Nev.	5,000	3,000,000	30,000	100	540,000	Dec.	1876	1 00	3,075,000	Sept.	1873	3 00	..	..	..	..	..	..	..	..	..	..	..	..	..	....
St. Joseph, L.	Mo.	2600 acs.	1,000,000	100,000	10	....	.....	.....	.....	250,000	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Santiago, G. S.	Nev.	2,000	11,200,000	112,000	100	....	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Savage, G. S.	Nev.	800	11,200,000	112,000	100	3,418,500	Sept.	1877	1 00	4,460,000	June	1869	3 00	..	13⅜	..	14⅛	..	14½	..	13¼	..	13¾	..	13¾	..	950
Seaton, G. S.	Colo.	1,700	500,000	50,000	10	*	.....	.....	.....	10,000	May.	1877	0 10	12	1 45	..	1½	1.40	..	..	..	..	..	..	..	..	400
Seg. Belcher, G. S.	Nev.	160	640,000	6,400	100	244,800	Apr.	1876	5 00	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Sierra Nevada G. S.	Nev.	3,650	10,000,000	100,000	100	1,800,000	Oct.	1877	0 50	102,500	Jan.	1871	1 00	10	..	..	..	..	..	..	..	..	..	..	..	..	....
Silver City, G. S.	Nev.	3,900	6,310,000	63,100	100	15,775	Nov.	1876	0 25	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Silver Hill, G. S.	Nev.	5,400	5,400,000	54,000	100	972,000	July.	1877	1 00	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
South Comstock, G. S.	Nev.	1,500	10,000,000	100,000	100	54,000	Jan.	1877	0 25	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
South. California, G. S.	Nev.	1,500	5,000,000	50,000	100	12,500	Feb.	1877	0 25	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Southern Star, G. S.	Nev.	1,500	6,000,000	600,000	100	....	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Trenton, G. S.	Nev.	..	10,000,000	100,000	100	....	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Union Cons., G. S.	Nev.	850	10,000,000	100,000	100	285,000	Oct.	1877	25	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
West Belcher, G. S.	Nev.	1,000	10,000,000	100,000	100	....	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Yellow Jacket, G. S.	Nev.	1,200	12,000,000	120,000	100	3,198,000	Sept.	1877	2 00	2,184,000	Aug.	1871	2 50	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Young America, S.	Nev.	1,000	3,000,000	30,000	100	64,500	Oct.	1877	0 20	....	.....	.....	.....	..	..	..	..	..	14	..	13¼	..	14	..	14	..	500
Copper Stocks.																											
Allouez, C.	Mich.	..	1,000,000	20,000	50	940,000	May.	1876	5 00	....	.....	.....	.....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Calumet & Hecla, C.	Mich.	..	2,000,000	80,000	25	1,200,000	.....	.....	.....	12,250,000	Oct.	1877	5 00	20	....	....	....	....	....	....	....	....	....	....	....	....	....
Central, C.	Mich.	..	500,000	20,000	25	100,000	June	1862	0 65	1,160,000	Feb.	1877	7 00	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Copper Falls, C.	Mich.	..	1,000,000	20,000	50	535,000	May.	1876	.....	100,000	Nov.	1871	1 00	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Dana, C.	Mich.	..	500,000	20,000	25	68,000	Jan.	1863	0 50	....	.....	.....	.....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Dawson, S.	Ont.	..	1,200,000	60,000	20	....	.....	.....	.....	....	.....	.....	.....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Duncan, S.	Ont.	..	1,200,000	60,000	20	75,000	July.	1876	41⅔	....	.....	.....	.....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Franklin, C.	Mich.	..	500,000	20,000	25	360,000	June	1876	5 00	585,000	Nov.	1871	1 00	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Humboldt, C.	Mich.	..	500,000	20,000	25	100,000	Sept.	1876	0 15	....	.....	.....	.....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
International, S.	Ont.	..	1,200,000	60,000	20	....	.....	.....	.....	....	.....	.....	.....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Madison, C.	Mich.	..	500,000	20,000	25	123,000	Sept.	1876	0 10	....	.....	.....	.....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Mesnard, C.	Mich.	..	500,000	20,000	25	160,000	Apr.	1876	0 50	....	.....	.....	.....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Minesota, C.	Mich.	..	1,000,000	20,000	50	436,000	June	1869	1 00	1,820,000	Mar.	1876	0 50	..	....	....	....	....	....	....	....	....	....	....	....	....	....
National, C.	Mich.	..	500,000	20,000	25	195,000	Oct.	1875	1 00	360,000	Oct.	1873	1 00	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Osceola, C.	Mich.	..	1,000,000	40,000	25	880,000	May.	1876	2 00	....	.....	.....	.....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Petherick, C.	Mich.	..	500,000	20,000	25	165,533	Mar.	1876	0 50	....	.....	.....	.....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Pewabic, C.	Mich.	..	500,000	20,000	25	185,000	June	1868	3 00	460000	July	1873	1 00	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Phœnix, C.	Mich.	..	1,200,000	20,000	50	817,500	Sept.	1870	3 00	20,000	Jan.	1876	1 00	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Quincy, C.	Mich.	..	200,000	20,000	10	....	.....	.....	.....	2,130,000	Feb.	1877	4 00	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Ridge, C.	Mich.	..	500,000	20,000	25	200,000	.....	.....	.....	90,000	Feb.	1875	1 00	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Rockland, C.	Mich.	..	500,000	20,000	25	495,000	Jan.	1874	1 00	....	.....	.....	.....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Star, C.	Mich.	..	500,000	20,000	25	265,000	Mar.	1876	0 50	....	.....	.....	.....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Superior, C.	Mich.	..	500,000	20,000	25	340,000	Mar.	1874	0 25	....	.....	.....	.....	..	....	....	....	....	....	....	....	....	....	....	....	....	....

G. Gold. S. Silver. L. Lead. C. Copper. * Non-Assessable.

Total Assessments levied to date.....$46,062,530 | Total Sales of coal stocks for the week..... 284,270 sh
Total Mining Dividends disbursed to date.....209,996,001 | Total Sales of Mining Shares for the week..... 70,520

* A dividend of 3½ per cent. was declared on the preferred stock of this Co. in July, 1877.

15¾ to 16c. L. & F. is quoted at 15⅞c.; Refined, 16c.; and Banca, 18½c.

Tin Plates.—The business in these has been very quiet. We quote, in gold, per box, as follows: Charcoal tins, $6.25@6.37½, and ternes $6; coke tins, $5.50, and ternes $5.37½.

Lead.—The nominal price is 4¾c., although some small jobbing sales have been made at less.

Spelter and Zinc.—Under a quiet business we quote at 5¾@6c., although a sale at a price less than our lower quotation is reported. We quote sheet zinc at 7⅜@7½c.

Quicksilver.—The San Francisco *Commercial Herald* of November 29, says:

"Since our last reference the *City of Peking* has arrived from Hongkong with a return shipment of 1,000 flasks, making 2,000 flasks received out of the 6,000 flasks purchased by the bonanza kings last July and August at an average price of about 70c. The price paid for these 6,000 flasks was higher than the ruling spot price has been for a long time past. But the fact is, that these large consumers were driven off by threats of a combination to put up the price to 75c., hence they sent a cablegram to Hongkong to purchase their supply, and by so doing broke the back of the combination ring, and taught them a lesson that they will not soon forget. The spot market at date is rather sluggish, but store supplies are more liberal than the daily receipts. The London price is £7 5s., and the stock in London, November 1st, was rising of 17,000 flasks, with every prospect of a large increase from the winter product of the Spanish mines. With us leading holders ask 47·5c., but we think it could be bought for less. Receipts for the week, 1,284 flasks."

Salt Lake Ore and Metal Market.

SALT LAKE CITY, UTAH, December 6, 1877.

Argentiferous Lead (*Base Bullion*).—$40 to $42 per ton for lead; $1.17 to $1.18 per ounce for silver: $20 per ounce for gold. The quotations for silver are based upon the silver contents in the lead of 80 to 120 ounces per ton of 2,000 lb.

Ore and bullion shipments from Salt Lake during week ending Nov. 24, 1877:

BULLION.

Consignor.	Consignee.	lb.	Totals.
Smelting Works			
Telegraph	Penn'a Lead	271,027	
Mingo	"	216,065	
Pascoe	"	21,554	
Morgan	"	65,939	574,585
Germania	Omaha	61,628	61,628
Pascoe	Cook & Co., Chic	21,056	
Durell	" "	85,250	106,306
Highland, Nev	St. Louis	21,749	
Morgan	"	43,936	65,685
			808,204

There might be added about 294,000 lb. Waterman bullion delivered to New York speculators and held here.

ORE.

Consignor.	Consignee.	lb.	Totals.
Jordan Concent'd.	Omaha	192,050	
Nabob Mine	"	44,000	
ConklinSampl. W	"	22,350	
Winnamuck Mine	"	20,000	
Emma "	"	63,900	342,300
Yosemite "	Beatty, Sac., Cal.	88,000	
Lead "	" "	89,550	177,550
Douglass "	Hilliard	60,400	
Flagstaff "	"	20,420	
Teewaukee "	"	21,000	
Carbonate "	"	66,000	
ConklinSampl. W	"	40,000	
Nabob Mine	"	105,000	
Green Ey'd Mon.	"	40,000	352,820
			872,670

FINANCIAL.

New York Stocks.

NEW YORK, Friday Evening, December 7, 1877.

The dealings in the Delaware, Lackawanna & Western Railroad Company have been the principal features in the movements of the coal shares on this market, the sales for the week amounting to over 184,000 shares—the stock closing strong at 50¾ against 50¼ a week ago. The extreme prices for the week have been 51⅜@47¾. 16,525 shares of the Delaware & Hudson sold at from 45 to 49½, closing at 48⅜. New Jersey Central stock is almost neglected, only 219 shares having changed hands, closing at 13¾. Prices have an upward tendency, and are thought to be mainly sustained through rumors of a coal combination.

Pennsylvania Coal Company.—The annual election for directors of this company will be held Dec. 27th.

Lake Superior Iron Co.—Sealed proposals for the sale of as many of the Lake Superior Iron Company's first mortgage bonds as the sum of $40,000 will purchase, will be received in Boston, on or before December 3. Proposals should state a price for the bonds and interest made up to January 1, 1878.

Montour Branch Railroad.—A company has been organized to build a railroad from a point eight miles from Pittsburg on the new Pittsburg and Lake Erie road up Montour Run about ten miles. It is said that the road can be built at a small cost, and with easy grades. It will serve several coal mines.

Miscellaneous Sales and Quotations.

Sales and quotations of the stocks and bonds dealt in here at Philadelphia, and Baltimore for the week ending the 7th inst. are given in the following tables. The Philadelphia quotations will have a * affixed. The Baltimore quotations are indicated thus †.

STOCKS.

	Quotations. Highest.	Lowest.	Closing.	Sales Shares
American Coal Co	—	—	35	—
*Cambria Iron Co	—	—	50	235
*Pennsylvania Salt Manf'g Co.	—	—	64	9
*Westmoreland Coal Co	—	—	62	—
*Buck Mountain Coal Co	—	—	25	—
*Schuylkill Nav. Co	—	—	—	—
St. Louis, I. M. & S. RR. Co	8	7½	7¾	725
Spring Mountain Coal Co	—	—	—	—
†Balt. & Ohio RR. Co. pref	—	—	—	—
" " " common	—	—	101	—
†Pittsburg & Connellsville RR.	—	—	—	—
†George's Creek Coal Co	—	—	99	—
†Santa Clara Mining Co	—	—	8¼	—
†Atlantic Coal Co	—	—	1.40	—

We are without quotations of the Baltimore market this week.

BONDS.

D. L. & W. 7s, Convt., 1892	J. & D.	—	—	—	—	
" " 2d mtge., 1881	M. & S.	—	—	105¼	—	
N. J. C., 1st mtge., new	F. & A.	113	112	112	$11,000	
" " 1st mt., cons. 1893	Q.	66¼	65⅞	65¾	14,000	
" " Convt	M. & N.	62	—	61⅝	11,000	
L. & W. B. Coal Co., cons.	Q.	32½	30½	33	71,000	
Am. Dock & Imp. 7s	J. & J.	—	—	40	—	
D. & H. C. Co., 1st m., 1884	J. & J.	99½	99¼	98½	12,000	
" " " " 1891	J. & J.	100	—	98½	1,000	
" " " " 1877	J. & J.	—	—	—	—	
" " " " reg., 1894	A. & O.	—	—	—	—	
" " " " coup., 1894	A. & O.	94	—	94	5,000	
St. L. I. M. & S., 1st mt. 1892	F. & A.	103½	—	103⅛	10,000	
Ches. & Ohio, 1st mt., 1899	—	27	—	25¾	1,000	
*L. V. RR., con. m. 6s, 1923	J. & D.	95	—	95	7,000	
" " 2d m., 7s, 1910	M. & S.	113¾	—	113⅜	5,000	
" " reg., 1898	J. & D.	108	—	108	2,000	
" " coup., 1898	J. & D.	—	—	—	—	
*P. RR., 1st mtge., 1880	J. & J.	107⅛	—	107½	13,000	
" Gen. mtge. reg., 1910	A. & O.	107	—	107	2,000	
" Con. m. 6s, cou. 1905	J. & D.	95	—	94	50,000	
" " " reg. 1905	Q.	—	—	—	—	
" gen M. Coup., 1910	J. & J.	107	—	107¼	1,000	
" New Loan 5s	—	109¼	—	—	10,300	
*P. & R. RR., 7s, 1893	A. & O.	113	—	—	4,000	
" " con. m. 7s, cou. 1911	J. & D.	100	99⅝	100	13,000	
" " Deb. 6s, 1893	J. & J.	37	—	—	2,000	
" " New convt. 7s, 1893	J. & J.	58	55	56	1,500	
" " Con. mtge. 7s, reg.	J. & D.	100	99⅜	99¾	29,000	
" " 6s, 44-80 1880	J. & J.	—	—	105	—	
*P. & R. C. & I. Co. Deb. 7s	M. & S.	—	—	—	—	
*P. & R. C. & I. Co	—	62	—	—	9,000	
*L. C. & N. Co. 6s, 1884	M. & Q.	103½	102½	103	7,200	
" " RR. loan 1897	F. & Q.	101⅛	—	101½	3,000	
" " Con. mtge. 7s.	J. & D.	—	—	—	—	
" " Cvt. gold, 1894	M. & S.	—	—	—	—	
" " Gold Loan, 1897	J. & D.	89¾	89¼	91	2,000	
Schuylkill Nav., 6s. 1897	M. & Q.	—	—	—	—	
Pa. and N. Y. Canal, 7s.	J. & D.	110½	110¼	109½	14,000	
Pa. Canal Co	J. & J.	—	—	62½	—	
Susquehanna Coal Co. 6s.	—	—	—	—	—	
†Ches. & Ohio 1st m. 6s.	M. & N.	—	—	—	—	
†Balt. & Ohio 6s. 1880	J. & J.	—	—	—	—	
† " " 6s. 1885	A. & O.	—	—	—	—	

Total transactions for the week.....$311,000

Philadelphia Stocks.

PHILADELPHIA, Friday Evening, Dec. 7, 1877.

A very steady market has characterized the movements of the coal shares in Philadelphia during the week under review. All of the stocks close at nearly the same quotations as prevailed a week ago, and in no instance throughout the dealings of the week do we observe a difference greater than one per cent. in the prices. The total transactions amount to about 95,000 shares.

The following stocks and bonds were sold at auction during the week:

Mammoth Vein Coal Company.—3,131 shares at $1¼ per share.

Pittsburg, Cincinnati, and St. Louis Railroad.—6 shares at 60c. per share.

Schuylkill Navigation Company.—$3,500 of the 6 per cent. bonds, @ 67 per cent.

Mount Carbon and Port Carbon Railroad Co.—The annual meeting of this company will be held December 31.

Schuylkill Valley Navigation and Railroad Co.—The annual meeting of this company takes place December 31.

The Mill Creek and Mine Hill Navigation and Railroad Co. will hold its annual meeting December 31.

Lehigh & Lackawanna Railroad Co.—A special meeting of the stockholders of this company was held December 7.

Copper Stocks.

Reported by Wilson W. Fay & Co., Room 7, Traveler Building, 31 State Street, Brokers in Mining and Miscellaneous Stocks.

BOSTON, WEDNESDAY EVENING, Dec. 5, 1877.

Another quiet week in this line of stocks, with few transactions to report. The tendency of the smaller stocks has been to weaken, while the larger ones are firm, with fair prospects of a rise. Calumet & Hecla has remained firm, and closes 176½ bid and 178 asked. Copper Falls is weaker, and looks like a decline, 2¼ being bid for it and 2⅜ asked. Central is weak at 36@36½. Franklin is still unchanged, and no prospect of a change is perceptible. National has got down to .02 bid and .05 asked, and little, if any, stock changing hands; the general impression being that very little of the assessment will be paid in. Quincy has spurted to 40 bid and 40½ asked, and closes strong at those figures. The other coppers remain unchanged.

Duncan Silver Mining Company.—The annual meeting of the Duncan Silver Mining Company was held at the Secretary's office yesterday afternoon. The report of the Secretary, Mr L. B. Stone, was submitted, from which it appears that there has been received from four installments, $124,845; from silver account, $12,389.85; loan account, $15,250. Total receipts, $152,484.85. The expenditures have been $152,456.03. Balance, $28.82. During the year past one installment on the stock was collected. Only five shares were forfeited for non-payment of the installment. The disbursements were made from the proceeds of silver ore, amounting to $6,322.90, and by loans secured by the Treasury stock.

The present liabilities of the company are about $19,000. The stamp mill was discontinued when the pile of stamp rock out was exhausted, and the men were then put at work making further explorations. On May 1 the engine-house and trestle work over the deep shaft were burned, involving a loss of $2,000, and month's time to replace the damage. Explorations with the diamond drill were begun August 23, and pursued since that time. While in the vein the drill dust has given constant traces of silver, and, by recent letters, silver appears in the drill cores about 17 feet from the cross-cut; but the position of the lode is not yet defined sufficiently to announce what should be done to develop it.

Besides the drill work now going on a party of miners is digging A 1 ore in the old ground under the engine house on tribute, and the reports are very encouraging.

An assessment of 50 cents per share has been levied, payable December 27, 1877.

The stock closes strong at ⅜ bid and ½ asked.

International is very weak, having declined to 12 bid and 15 asked.

Gold and Silver Stocks.

NEW YORK, Friday Evening, Dec. 7, 1877.

The transactions in mining shares during the week under review have aggregated 70,520 shares, the bulk of the transactions being in the low priced stocks. The stock of the Bertha & Edith Mining Co. has taken up one-third of the whole transactions, the closing quotation being one cent per share, and it is probable that it will soon disappear from the list. We do not observe any feature in the market worthy of special comment, the quotations of the better class of securities are fairly steady, and it will only need a few such announcements of dividends, as noticed below, to create an increased demand for these stocks from outside investors.

DIVIDENDS.

The following list of dividends payable during the present month declared by those mining companies whose stocks are sold on this market is a refreshing contrast to the present scarcity of such announcements in railroads, manufacturing and other enterprises, and is a very encouraging outlook to those seeking a profitable field for investment of capital, for in no other industry can we receive better returns than in mining when the investments are prudently made.

Ontario Min'g Co.,	$1.50	per share,	agregat'g..		$150,000
Moose	"	25 cts.	"	"	50,000
Hukill	"	10 "	"	"	10,000
American	"	10 "	"	"	10,000
Merrimac	"	10 "	"	"	5,000
Total					$225,000

Sutro Tunnel.—Ledge porphyry, with occasional streaks of quartz and clay, is the material being passed through at present. Constant timbering required. Total length of tunnel on the 28th ult., 18,348 feet.

Ontario Silver Mining Company.—Under the influence of the announcement of the regular monthly dividend of 50c. per share, and two extra dividends of 50c. per share each. This stock shows a decided advance—a final sale of 250 shares being made to-day at $29 per share. This price is an advance of $4 per share from the quotation ruling a week ago. With the dividends above announced, this company will have paid to its stockholder within nine months $850,000—equal to $17 per share. The November product of this Company was 90 bars of bullion, having an assay value of $168,411.79. We shall publish in our next issue, a description of this mine and mill.

Ophir.—The bulk of this stock, it is stated, has passed into the hands of the bonanza firm of Flood & O'Brien. This is confirmed in the following telegram:

"SAN FRANCISCO, December 4.—The Sharon directors of the Ophir Company resigned yesterday. A new board was elected today representing Flood & O'Brien, who have also obtained control of the Mexican Mine and put in their own director, George R. Wells in both boards, and appointed Colonel Fair general superintendent. The bonanza firm now control all mines from Chollar to Union, upwards of 5,000 feet, being the heart of the Comstock Lode, and embracing Hale and Norcross, Savage, Gould and Curry, Best and Belcher, Consolidated Virginia, California, Ophir and Mexican Mine. The aggregate capital of these mines is $162,000,000."

A very large business has been done in this stock on the San Francisco market, at very irregular prices. It opened to-day, in San Francisco, at $48.50 per share, as against $52 per share a week ago. The latest official

information from the mine, dated the 28th ult., says:

"Drifts were started both north and south on the ore vein recently opened on the 1,900 level. At a distance of 20 feet, the north drift ran into broken porphyry mixed with streaks of ore, and was stopped on account of not having a sufficient amount of air for both drifts. The south drift crossed the ore vein diagonally to the eastward, and, at a distance of 25 feet from the starting point, penetrated into the east wall, in which it still continues. The ore passed through before reaching the wall was very rich, assaying from $400 to $600 per ton. An attempt was made, during the week, to start up the south drift on the same level running in the direction of the deep winze on the California; but the water proved too strong and hot to admit of it. Yesterday, a diamond drill was placed at work in the face of the drift, when the diamonds were broken, and the drills have not yet been repaired so as to resume operations."

MINING STOCK QUOTATIONS IN SAN FRANCISCO.

We give below a table showing the closing price of mining shares in San Francisco yesterday, 6 inst.

Alpha	15¼	Mexican	15⅝
Belcher	7¾	Northern Belle	11
Best & Belcher	22	Ophir	48¾
Bullion	8¼	Original Comstock	..
Caledonia	5⅛	Overman	28½
California	20⅜	Raymond & Ely	9
Chollar Potosi	44	Santiago	..
Con. Imperial	1¼	Savage	12½
Con. Virginia	24	Seg. Belcher	45
Confidence	7	Sierra Nevada	6¼
Crown Point	8¼	Silver City	..
Eureka	36	Silver Hill	3½
Exchequer	6	South Comstock	..
Gould & Curry	11	South California	..
Hale & Norcross	12⅜	Southern Star	..
Indian Queen	..	Trenton	..
Julia	3¼	Union Con	7¼
Justice	14¼	West Belcher	..
Kentuck	6½	Yellow Jacket	13¼
Kossuth	..	Young America	..
Leopard	1½		

The *Commercial Herald* of the 29th ult. says of the market at San Francisco: "Marked activity prevailed in a number of stocks during the past week, the upward tendency in such stocks as the Alta and others being quite a feature upon which to base operations in other and less promising directions. The variations in Ophir have likewise been of moment, and from the pretty well authenticated fact that the 'bonanza' people invested largely in it in the early part of the not yet very well established find—so far as the public are concerned—it may possibly be taken as an indication that a new bonanza is likely to be uncovered there. At any rate, they would be certain to have the most reliable information on the subject, and we hardly think they would purchase for the purpose of putting up a job, though such transactions have heretofore transpired through the manipulations of equally good men. With regard to the rapid exhaustion of the Con. Virginia bonanza, there seems to be little doubt, and which the elaborate and carefully detailed weekly reports of Col. Fair fail to cover to the satisfaction of the public, though the effort to do so is very apparent. There is no question but the bonanza firm are carefully looking about to obtain any other bonanzas that may turn up, and we take it rather safe to follow where they lead, if those who do so are only careful to watch the market in all its varied phases."

Assessments with dates when delinquent: Crown Point Ravine, 10c, Dec. 24; Haskin, 20c, Dec. 25; Hemlock Con., 5c, Dec. 12; Pawnee, 10c, Dec 3; New England, 10c, Dec. 31; Falcon, 15c, Dec. 31; De Frees, 25c per share, amounting to $25,000. Excelsior Deep Gravel Mine, 50c per share.

The Leeds Mining Company has declared a dividend of 20c per share.

The Empire Gold Mining Company of Sierra County, Cal., has declared a dividend of $2 per share.

The Alaska Mine recently paid its fourth dividend of 10c per share.

Gas Stocks.

NEW YORK, FRIDAY EVENING, Dec. 7, 1877.

Gas stocks continue dull, and with but slight alterations in the quotations.

The stocks of the Central Gas Company, of Westchester County, show a decline of $5, as compared with the quotations prevailing a week ago.

Lighting the Streets of New York.—The Gas Commissioners, consisting of the Mayor, the Comptroller, Commissioner of Public Works, met in the office of the latter to-day, and opened proposals for lighting the streets for the four months ending April 30, 1878. The following proposals were received: New York Gas Light Company, $6 per lamp; Manhattan Gas Light Company, $6 per lamp; Metropolitan Gas Light Company, $6.90 per lamp; New York Mutual Gas Light Company, $8.88 per lamp; the Harlem Gas Light Company, $8.30 per lamp; Yonkers Gas Light Company, for lamps at Riverdale, $12 per lamp; Globe Gas Company (naphtha), $8 per lamp; James Bryan (naphtha), $11.33 per lamp. The awards will be made in a few days.

Lighting the Public Departments of the City.—The bids for furnishing illuminating gas for lighting the public markets, buildings, and offices for the year 1878 were as follows: New York Gas Light Company, $1.90 per thousand feet; Manhattan Gas Light Company, $1.90; Metropolitan, $2.25; New York Mutual, $2; Harlem Gas Light Company, $2.75.

The Cleveland (Ohio) Gas Question.—At a meeting of the Common Council, of Cleveland, on the 3d inst., the following resolutions were passed, effecting a saving of $5 per lamp on the 3,084 gas lamps in the city, or $15,420 for the year:

"*Whereas*, John P. Humphrey has agreed to annul his present contract with the city, and to furnish light to the city through his coal oil lamps for $18 per post per year, providing the Council will agree to assist in securing him the contract for five years after the expiration of the present contract, thus effecting a saving to the city of $13,741 during the time of the unexpired contract.

"*Resolved*, That the City Council do hereby pledge themselves to assist in securing such contract, and agree to enter into the contract when the authority so to do is given them, provided that the new contract shall allow the city to reduce the number of lamps to 1,000, but not to a less number.

"A resolution was also adopted, requesting the Legislature to pass an amendment to a State law so as to enable the city to contract for a supply of gas."

Boston, Mass., Gas Co.—This company announces a dividend of 2¼ per cent. on its capital stock, amount-

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ing to $62,500. We no te a recent auction sale of 5 shares of the stock of this company at $820 per share.

The Scranton, Pa., Gas and Water Supply.—The city of Scranton being indebted to the Gas and Water Company to the extent of $30,000, and there being no prospect of payment, the company has shut off both the gas and the water.

The following list of Companies in New York and vicinity are corrected weekly by GEORGE H. PRENTISS, Broker and Dealer in Gas stocks, No. 30 Broad street. N. Y.

Companies in New York and vicinity.	Capital Stock.	Par.	Dividends. Rate per an.	Dividends. Am. of last.	Dividends. Date of last.	Quotat'ns Bid.	Quotat'ns As'd
	$						
Mutual, N. Y.....	5,000,000	$100	10%	2½	Oct. '77	92	95
" Gold Bonds	90,000	1,000	7%	3½	Feb. '77	100	103
N. York "	4,000,000	....	10%	5	Nov '77	120	124
Metrop. "	2,500,000	100	10%	5	June '77	131	133½
" " Certf.	1,000,000	....	7%	3½	" "	100	103
" " Bonds	500,000	1,000	7%	3½	" "	102	—
Harlem "	1,850,000	50	8%	3½	Aug. '77	95	100
Manhat. "	4,000,000	50	....‡	5	Nov '77	210	215
Brooklyn, B'klyn.	2,000,000	52	15%	5	July '77	165	175
Nassau, " ...	1,000,000	25	....‡	4	July '77	80	85
" " Certf.	700,000	1,000	7%	3½	July '77	—	101
People's, " ...	1,000,000	10	....‡	3½	July '76	—	45
" " Certf.	300,000	1,000	7%	3½	July '77	80	85
" " B'ds	325,000	....	7%	3	Feb. '77	96	100
Metrop. "	1,000,000	10	5%	2½	Nov '77	65	70
Wmsb'rg "	1,000,000	50	10%	2½	July '77	117	123
" " Certf.	1,000,000	....	7%	3½	July '77	100	102
Citizen's "	1,200,000	20	....‡	4	Jan. '77	80	85
" " Certf.	320,000	1,000	7%	3½	Oct. '77	97	100
J. C., N. J.....	750,000	20	10%	5	July '77	100	—
Con. Westch. N.Y	466,000	50	7%	4	July '77	70	85
Subur'n " "	295,000	50	7%	3½	Oct. '77	—	95
Municipal, N.Y..	1,500,000	100	.....	.....	.....	85	100

‡ Paid irregularly.

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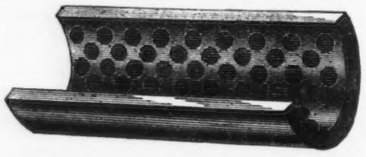

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Priority Aug. 28, 1872. — *Patented Dec.* 24, 1872.
Patented March 17, 1874. — *Patented Sept.* 30, 1873.

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